TEMISKAMING ENVIRONMENTAL ACTION COMMITTEE

REPORT:

"PESTICIDE USE IN NORTHERN ONTARIO AND RECOMMENDATIONS FOR PUBLIC PARTICIPATION IN THE DECISION-MAKING PROCESS"

WITH A REVIEW PREPARED BY
PESTICIDES CONTROL SECTION
MINISTRY OF THE ENVIRONMENT

AUGUST 1980

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TABLE OF CONTENTS

TITLE	PAGE NO.
Federal Regulation	1
Provincial Regulation	3
District Pesticide Users	12
Recommendations for Public Participation	13
Pesticide Use in Northern Ontario	18
Specific Pesticide Information	20
Pesticide Drift	26
Synergism	27
Responses to Recommendations Concerning Pesticides	28
Conclusion	31
References	32

Federal Regulation:

Pest Control Products Act and Other Federal Acts:

The Temiskaming Environmental Action Committee Report (the Report) has clearly outlined the intent of the Pest Control Products Act, 1969, and Regulations, which serves as the principal federal legislation controlling the sale and use of pesticides. The Foods and Drugs Act, Environmental Contaminants Act, Fisheries Act, the Migratory Birds Convention Act, the Northern Inland Water Act and the Arctic Waters Pollution Prevention Act all serve to regulate pesticides in special situations, not directly covered under the P.C.P. Act. The Report failed to mention the Ocean Dumping Control Act, and the Canada Water Act, both of which are concerned with water quality, and the proposed Transportation of Dangerous Goods Act. This latter Act is especially important and will apply to all dangerous goods or substances, including pesticides, known to be transported in Canada. Materials will be evaluated by the Departments of Fisheries and the Environment, and National Health and Welfare and categorized according to their environmental and human health hazards. The process of evaluation under the new Act will be similar to that which currently exists for reviewing pesticides.

Pesticide Registration Process and Re-evaluation:

The information outlining the pesticide registration process accurately describes its complex nature. The major point to emphasize is the co-operation and involvement of numerous government departments, such as Agriculture Canada, Health and Welfare Canada, and Fisheries and Environment Canada to ensure that products are thoroughly evaluated for merit and safety.

Pesticides are registered for a 5-year period, after which the status of each individual product is reviewed. Detailed re-evaluations of active ingredients are conducted at various times, depending on use experience and new scientific information.

Canadian officials monitor the review programs progressing in other countries, particularly the United States, and in this way learn of any health or environmental concerns identified elsewhere.

In addition, government officials promptly investigate incidents in Canada related to pesticide use that are claimed or suspected to have caused an environmental or health hazard. Chemical companies and other federal and provincial agencies are notified and quick action is taken to resolve the situation.

Communication among federal and provincial government officials is further strengthened through the Canadian Association of Pest Control Officials (C.A.P.C.O.). This association meets semi-annually and provides for the exchange of technical and regulatory information among federal and provincial agencies responsible for the registration and the control of the manufacture, sale and use of pest control products in Canada.

Provincial Regulation:

The Pesticides Act:

The main purpose of the Pesticides Act, 1973 and Regulations has been outlined. However, the Report did not describe very clearly the schedules in which products are classified and the licensing and permit system.

The six schedules can be briefly explained as follows:

Schedule 1 - (Restricted):

1) Restricted pesticides, a specific use permit is required;

2) Pesticides that pose a serious hazard to public health and/or natural environment;

3) Pesticides exhibiting Acute Oral LD_{50} 0-50 mg/kg, Acute Dermal LD_{50} 0-100 mg/kg and Inhalation Limits LC_{50} 0-2 mg/kg;

Schedule 5 - (Agricultural Exempt):

1) Limited to application on agricultural land, where suitable alternatives are not available;

2) Pesticides that pose a serious hazard to public health and/or the natural environment;

3) Pesticides exhibiting Acute Oral LD_{50} 0-50 mg/kg, Acute Dermal LD_{50} 0-100 mg/kg and Inhalation Limits LC_{50} 0-2 mg/kg;

Schedule 2 - (Commercial and Agricultural):

1. Restricted to agriculturists, licensed exterminators and registered custom sprayers;
2. Pesticides that do not present problems of long term persistence or accumulation in biological tissues;

3. Pesticides exhibiting Acute Oral LD_{50} 50-500 mg/kg, Acute Dermal LD_{50} 100-1,000 mg/kg and Inhalation Limits LC_{50} 2-20 mg/kg;

Schedule 3 - Suitable for Home and Garden Use:

1. Available to the homeowner and also includes bulk packaging for commercial and agricultural use;

2. Hazards are considered minimal when using these pesticides;

3. Pesticides exhibiting Acute Oral LD_{50} 500-5,000 mg/kg, Acute Dermal LD_{50} 1000-10,000 mg/kg and Inhalation Limits LC_{50} 20-200 mg/kg.

Schedule 4 - (Unrestricted and container approved)

1. Schedule 4 products are those that can safely be handled by any retail outlet. All products are evaluated for container safety before being approved for distribution at these outlets;

2. Pesticides exhibiting Acute Oral LD_{50} 5,000 mg/kg, Acute Dermal LD_{50} 10,000 mg/kg and Inhalation Limits LC_{50} 200 mg/kg;

Schedule 6 - (Container size restriction)

1. Schedule 6 products are similar to those in Schedule 4 but the containers are not suitable for sale at unlicenced outlets;

2. Pesticides exhibiting Acute Oral LD_{50} 5,000 mg/kg, Acute Dermal LD_{50} 10,000 mg/kg and Inhalation Limits LC_{50} 200 mg/kg;

The Ontario Pesticides Advisory Committee (O.P.A.C.) is responsible for reviewing and recommending products for classification. This Committee comprises representatives from agriculture, federal and provincial agencies, industry, universities and the medical profession, each of whom is a specialist in a particular area. This provides a thorough evaluation of all products to minimize environmental and health hazards associated with their use.

The Pesticides Control Section, Ministry of the Environment (M.O.E.) promotes the safe use and sound management of pesticides under the Pesticides Act, 1973. Licences are required to operate an extermination business and to perform land, water and structural exterminations, unless such individuals are exempt under the Regulations. The exemptions are clearly stated in the Regulations and are not limited to agriculturists. The main exemptions for land, water and structural exterminations include the following:

1. Land exterminations for domestic purposes with Schedule 3, 4 and 6 pesticides.

2. Exterminations with Schedule 4 or 6 pesticides on one's own premises or that of one's employer.

3. Land exterminations by agriculturists with Schedule 2, 3, 4, 5 and 6 pesticides.

4. Exterminations by householders or tenants with Schedule 3, 4 and 6 pesticides.

5. Water exterminations on one's property provided that the water is wholly located within the property boundaries and is not draining into a well, lake, river or other watercourse.

Licensing and Permit System:

Applicants for exterminators' licences are supplied with extensive study and resource material pertaining to their licence application. A Pesticides Safety Handbook is included in this study material and individuals are encouraged

to keep the manual as a handy reference in their day to day activities. The handbook covers various topics including safety precautions, protective equipment, emergency action, first aid procedures, and information on the classes of chemicals and their toxicity. Additional pamphlets prepared by the Ministry of Agriculture and Food are supplied and these outline recommended control practices in the production of field crops, vegetables, fruits, ornamentals and turf.

Applicants are required to pass either an oral or written examination before licences are issued. Candidates are examined on their knowledge of The Pesticides Act and Regulations, safety procedures and protective equipment, proper storage of chemicals and the toxicity and application techniques for specific pesticides pertaining to their licence.

In addition, permits for land, water and structural exterminations are required under The Pesticides Act in a number of situations. These include: (1) use of Schedule 1 pesticides, (2) aerial application of all Schedule 1, 5 and hormone-type Schedule 2 herbicides; and (3) use of any pesticide by an individual not licenced or permitted to do so under the Act.

Five classes of vendor licences including wholesale, limited wholesale, Class 1 retail, Class 2 retail and Class 3 retail exist under the Pesticides Act. There are strict regulations concerning the sale of pesticides at these outlets and specific instructions for proper storage and display of pesticides. Warning signs must be prominently displayed at all entrances to buildings where pesticides are stored and displayed and the sale or transfer of all Schedule 1, 2 and 5 pesticides must be recorded. Vendor inspections are conducted by Ministry of the Environment district officers periodically to ensure that there is strict adherence to the Regulations.

The licencing of individuals and the issuing of permits provides for the proper application of pesticides according to established use patterns. In addition, prohibitory clauses exist under the Act to correct the misuse of pesticides primarily through the issuing of stop orders, control orders and the imposition of fines.

Environmental Assessment Act

The Report has a good grasp of the intent of the Environmental Assessment Act, (E.A. Act) namely prevention rather than after-the-fact mitigation. However, the Report exhibits some misunderstanding on the part of T.E.A.C. of the definition of the term "environment", the manner in which the Act is being implemented, and the functioning of the Act's review and approvals process.

The broad definition given to the term "environment" in Section 1.c. of the Act is for the purposes of ensuring that the objectives of the Act will be achieved. By using the phrase "potential environmental disturbance" to describe part of the risk - benefit analyses required by the Act, the Report commits the fundamental error of equating the term "environment" with the more limited meaning implied by the phrases: air, land, water, plant and animal life. In the Act, "environment" is defined in very broad terms to include not only the "natural" aspects of the environment, but also human beings as part of the environment. The Act requires that an environmental assessment take into account natural, social, cultural and economic factors. This broad sense should be reflected when using the word "environment" and its derivatives.

The Report exhibits some confusion as to the current application of the Act. The policy of the government has been to implement the Act on a phased basis, initially applying the Act to Ontario Government projects, then to municipalities and finally, in the future, to the major, environmentally significant, undertakings of the private sector. Therefore, the pesticides programs of agencies such as Bell Canada, Canadian Pacific and Canadian National are not subject to the Act as they are activities of the private sector and the federal government.

The Report makes reference to the seemingly voluminous amount of exemptions which have been granted. When the Act was put into force it was necessary to grant "grand-father" type exemptions to avoid the disruption of projects and legal entanglements which would have been experienced were the Act to have been, in effect, retroactively applied to the projects already "in the pipe", in advanced stages of planning or design. A second form of exemption was also required to handle projects deemed to have such insignificant environmental effects that environmental assessment would be unnecessary. It was a decision of Cabinet that, in

general, the activities of certain ministries, including the Ministry of Agriculture and Food, did not significantly adversely affect the environment, and therefore those ministries were specifically exempted from the application of the Act.

In addition to these two forms of exemption, (based on the timing of planning, or the nature of the proponent), there was a third general form of exemption established to cover ongoing operational activities. Activities that are for the purposes of operations or maintenance and that have been ongoing since before the Act was proclaimed, (1975), are exempt under Section 4 of Ontario Regulation 836/76. Pesticide activities which are for the purposes of maintaining rights of way, property or resources of agencies such as Ontario Hydro, M.T.C. or M.N.R. are exempt provided the pesticide programs or the activities for which the pesticides programs are conducted were established prior to the Act coming into force, or the activities have received approval under the Act. Pesticides activities associated with undertakings for which E.A. approval is required, (e.g. pesticides spraying on the part of M.N.R. for the purposes of forest management), are subject to the Act and must be fully discussed in the environmental assessments which may be submitted on the larger undertakings, of which the pesticides activities are only component parts. Therefore, in the case of the Ministry of Natural Resources, it is expected that the class environmental assessments on forest management activities, lake reclamation, and roads and access points will be outlining the planning that goes into a decision to adopt pesticides activities as part of the larger undertakings. Guidelines on the use of pesticides, including programs to mitigate any adverse effects which may result from such programs, will be included in M.N.R.'s class environmental assessments. Similarly, it is expected that Ontario Hydro will be addressing pesticide activities as part of its description of how right-of-ways are maintained in the class environmental assessments which it will be submitting to cover transmission facility establishment.

When considering the status of projects which are exempt from the Act by virtue of the fact that the proponent of the activities may be exempt, (eg. Agriculture and Food or the private sector), or because the project itself appears to meet the terms of the general exemption mechanisms discussed above, (e.g., operation or maintenance), one must bear in mind the fact that the Act provides a mechanism whereby a project which appears to be exempted from the Act may be brought under the Act by designating regulation.

In terms of pesticides activities, it can be anticipated that some spray programs may be of such a large scale or involve such extremely sensitive environments that the application of the Act would be appropriate. Were such a spray program to be proposed by the private sector or a provincial agency which was generally exempt from the Act, the government could act to designate that activity under the Act by regulation. The use of designating regulations to bring major undertakings, not already subject to the Act under the E.A. process has been utilized in the case of Reed Paper Limited's Northwestern Ontario Forest Products complex proposal, INCO's Spanish River Hydro Electric Proposal and Onakawana Development Limited's Lignite proposal.

A number of minor corrections should be made to the section of the Report which outlines the formal review and approvals process of the Act. When the review of the environmental assessment is completed, notice is given and any interested and concerned party has 30 days, (or more as specified in the notice), to make a submission concerning the project, the environmental assessment document, or the Government Review of that document. Therefore, the public is afforded an opportunity to comment on the manner in which the Government has reviewed a proponent's assessment document or the proposal itself. At the termination of this review period the Minister makes a decision as to whether the environmental assessment document is adequate to enable a decision to be made as to whether approval to proceed with the undertaking, with respect to which the environmental assessment document is submitted, should or should not be given. Notice of the Minister's decision on the acceptability of the environmental assessment document is given and a 15 day review period is established in which interested and concerned parties may make submissions on the Minister's decision. At the termination of this review period the Minister, with the approval of Cabinet, gives a decision on whether the project should or should not proceed. The Act provides the opportunity for hearings before the Environmental Assessment Board on both of the two decisions which must be made under the Act prior to a project being allowed to proceed.

Other Provincial Acts

The Report failed to mention additional pieces of provincial legislation which influence pesticide use. First, the newly enacted Occupational Health and Safety Act, 1978 provides protection for workers using toxic substances in the work place. Employers are responsible for providing protective devices and equipment, identifying hazards to the employees and training personnel on the safe use of toxic products.

Secondly, the Ontario Water Resources Act, 1970 provides authority for maintaining water quality. Activities under the Act are directed towards detecting and preventing the contamination of lakes, streams and groundwater.

Thirdly, The Weed Act, R.S.O., 1970 and amendments thereto, states that "every person in possession of land shall destroy all noxious weeds thereon," and lists 23 weeds which have been designated as noxious. The Act provides for the destruction of both plants and seeds by several means, including treatment with herbicides.

Fourthly, the Bees Act, 1970 provides protection for bees by prohibiting persons from spraying or dusting fruit trees, while trees are in blossom, with any substance injurious to bees.

Lastly, the Environmental Protection Act, 1971 was enacted to provide protection and conservation of the natural environment by prohibiting individuals from discharging or depositing any contaminant into the natural environment. Under the Act, the term "contaminant" includes solids, liquids, gases, odours, heat, sounds, vibrations, radiation or combination of any of them resulting directly or indirectly from the activities of man.

The Pesticides Advisory Committee

The scope and objectives of the Advisory Committee are outlined accurately in the Report. While there may not be a formal channel whereby concerned citizens or public interest groups may make submissions to the Advisory Committee, the Committee is prepared to receive requests for appearances before it. Adequate time must be given for the scheduling of appearances before the Committee and submissions must be sincere, documenting scientific evidence rather than fears or suspicions.

Pesticides Appeal Board

The Pesticides Appeal Board provided an appeal forum for persons affected by Ministry decisions under The Pesticides Act, regarding the licensing of pest control operators and exterminators, and the use and control of pesticides. The powers and duties of the Pesticides Appeal Board are now exercised through the Environmental Appeal Board.

The Environmental Appeal Board must act under the auspices of the Statutory Powers Act, 1971. Most of the hearings are open to the public; however, the Board can decide to hold hearings "in camera" for reasons of security, financial or personal matters.

District Pesticide Users and the Decision Making Process:

The T.E.A.C. researchers received good co-operation from the six government and public service agencies listed in the Report. The information outlining the decision making process was supplied by the respective agencies. Each agency is responsible for implementing its own pest control programs, and each employs trained personnel to monitor local weed and/or insect populations and decide on the most suitable method of control. Control programs utilize a variety of practices including manual and mechanical cutting, natural or biological control and chemical control, each of which is assessed for a particular situation.

Each agency conducts training programs for its employees in the application of pesticides, and all applicators are either licensed exterminators under the Pesticides Act or under the direct supervision of such persons. Ontario Hydro and the Ministries of Transportation and Communication, and Natural Resources, have prepared spray manuals which clearly outline materials and methods used in their weed and/or insect control programs.

The Ministry of Agriculture and Food should be differentiated from the remaining five agencies in that its main function is to provide production recommendations to the agricultural sector. Farmers make the final choice of the chemicals to be used depending on the crops to be grown and pests to be controlled, but are regulated in their pesticide applications by authority of the Pest Control Products Act and the Pesticides Act, 1973.

RECOMMENDATIONS FOR PUBLIC PARTICIPATION:

The channels by which concerned individuals can express their opinions or obtain specific information on pesticide use have been and always will be available. Many people do not realize these avenues exist or do not wish to take full advantage of them. Letters of concern may be directed to Ministers, M.P.s, M.P.P.s and various government agencies requesting justification for, or explanations concerning, government programs.

FEDERAL RECOMMENDATIONS:

The Rebuttable Presumption Against Registration (RPAR) process in the United States and the review and re-evaluation process in Canada accomplish the same goal, that of identifying and documenting health and environmental concerns regarding pesticide use. Both procedures concentrate on older compounds and are methods of updating scientific information and modifying use patterns to minimize potential environmental and human health hazards.

The federal government communicates fully and openly in regard to their pesticide regulatory activities. The evaluation of pesticides is a complex study and must involve specialists in many scientific disciplines. This evaluation is accomplished with the existing federal system and any changes or modifications to this process, such as greater public input, would not improve the scientific review of these older compounds.

Public input into the initial registration of compounds, both in the United States and Canada is not sought because much of the information submitted in support of registration of new products is confidential until the expiry of the patent date. However, a summary of the toxicological information on specific compounds being submitted for registration is available from the federal government and chemical company.

PROVINCIAL RECOMMENDATIONS:

ENVIRONMENTAL ASSESSMENT ACT:

This section begins by discussing recommendations to the Environmental Assessment Act, since this is the initial point of the decision-making process with respect to provincial environmental legislation. The Act prohibits the government from granting an undertaking, which is subject to the Act, any licenses, permits, approvals, permissions or consents which may be required under any other statutes, until that undertaking has received E.A. approval. In addition, the Province cannot provide loans, guarantees of repayments, grants or subsidies to an undertaking which is subject to the Act until that undertaking has received E.A. approval.

The Report's first recommendation is not consistent with the government's policy respecting the application of the Act, namely that the Act be developed and refined via application to provincial projects prior to a general application to the major undertakings of the private sector.

The second recommendation that all agricultural spray programs be placed under the Act is not consistent with the policy of applying the Act to only those activities which would have significant effects on the environment. An agricultural pesticides activity of the private sector or a government agency which is generally exempt can however, be brought under the Act by regulations, if that activity has the potential to significantly affect the environment.

In response to the third recommendation, which is aimed at encouraging greater public participation in decision-making on pesticides programs, it is felt that the E.A. process itself already provides adequate opportunities for public involvement in decision-making. Proponents who are preparing environmental assessments are always encouraged to contact the potentially affected public as early in the planning process as possible. Although formal public participation is not a statutory condition for an acceptable environmental assessment, M.O.E. always points out, in any guidelines that are written to assist in the preparation of environmental assessments, the fact that meaningful public participation in planning decision-making is invaluable to proponents. The local public are often more aware of the issues, resources and alternatives that may be available than are immediately

evident to the proponent or his consultants. Early involvement in planning promotes a greater understanding of the issues on the part of all parties involved and often assists in expediting decision-making on approvals.

In addition to the encouragement M.O.E. provides in guidelines on environmental assessments, the formal review and approvals process of the E.A. Act itself provides an opportunity for the public to become involved in decision-making. For example, Sections 2, 12, and 13 of the Act provide an opportunity for anyone to require a hearing, regardless of whether or not that person has economic or property interests and, in so doing, creates an extremely broad definition for "standing" at a hearing. Section 11 of the Act allows the Minister to require any information to be submitted. Section 32 of the Act requires that a public record be set up for each environmental assessment submitted, to provide equal access to all fundamental information, and every effort is made to ensure that the general public knows where the record can be inspected.

The fourth recommendation of the Report suggests that the statutory condition of the Act which allows the minister to rule that certain evidence should not be disclosed and the sections which allow the E.A. Board to hold hearings "in camera", should be removed. The hearings of the E.A. Board fall under the Statutory Powers Act. The practicalities of dealing with evidence which is of a business or unique technological nature necessitates that certain mechanisms to create a situation of confidentiality be available. The Act has provisions to restrict full disclosure of information in certain situations. Section 31 allows for orders to prevent or limit disclosure and Section 28 requires that Provincial Officers keep certain matters confidential. The Act also provides for "in camera" hearings in special circumstances.

"Trade Secrets" can be included in the category of information classified as being confidential. Criteria for defining trade secrets would include:

- How secret is the information? Will disclosure increase, to a significant degree, the number of people having knowledge?

- Is the information of continuing value to the possessor of that information?

- Have steps been taken, or are steps being taken, by the possessor to protect the information?

- Is the information specifically required to be made public under any other statutes?

- What damage would the possessor suffer from its disclosure compared with the benefits that are likely to flow from the disclosure?

In summary, the heart of the issue of confidentiality is basically how to strike a balance between "the right of the public to know" versus "the legitimate needs of the proponent for protection".

When considering the question of confidentiality one should bear in mind the fact that the review and approvals structure of the Act is basically an open process. However, it would be naive to assume that provisions for confidentiality should not be invoked in events where technological information describing unique processes, economic data pertaining to marketing strategies, or financial information on rates of return in cash flows, etc, arise.

The fifth recommendation of the Report suggests that the powers of the Minister and Cabinet to reject or alter decision of the E.A. Board be limited to that of simply having the right to request another hearing. The Board considers the technical, social, and economic aspects of most matters before them; however, for matters of such magnitude or importance involving over-riding economic or social considerations, the final decision should rest in the hands of those responsible to the electorate.

PESTICIDES ACT:

The Report lists a number of recommendations whereby the public could actively participate in dealing with the Pesticides Act through the Pesticides Advisory Committee.

The sixth recommendation, suggesting that all sprayed areas, both operational and experimental, be posted with officially authorized signs showing date and chemical used, is neither practical or necessary. The Ministry of the Environment recommends that persons be restricted from treatment sites only while spray operations are in progress and for several hours thereafter, to allow sufficient time for the pesticide spray to dry. This recommendation and the fact that aerial spraying is done during the early morning and evening, does not indicate a need to implement a large scale program of posting treated areas.

Furthermore, the posting of treated areas requires legal interpretation providing specific instructions for the placement of such signs and would not necessarily achieve a greater public awareness among residents of local spray programs.

The seventh recommendation concerns the creation of a formal channel whereby concerned citizens may make submissions to the Pesticides Advisory Committee. This Committee was formed to review the scientifically documented effects of pesticides, and to this extent, accepts briefs and submissions from a number of different sources, including the public. Therefore, the creation of a formal channel of communication would not achieve greater public participation.

The Report's suggestion, that all of the agricultural sector be brought under the licence and permit requirements of the Pesticides Act is not acceptable. Regulatory controls currently exist regarding pesticide application by agriculturists. Residue limits for edible and feed crops have been determined by the federal government and this requires that particular attention be given to following product label directions. The Ministry of Agriculture and Food is co-operating with farmers in developing integrated pest management programs, and this, along with economic considerations in controlling pests assists in regulating pesticide use in this sector.

PART II - PESTICIDE USE IN NORTHERN ONTARIO

This section of the Report should discuss either pesticide use in Northern Ontario and include the districts of Algoma, Cochrane, Kenora, Manitoulin, Nipissing, Rainy River, Sudbury, Thunder Bay and Temiskaming or should limit the discussion to the district of Temiskaming only. Table I entitled 1979 Pesticide Use - Temiskaming District shows this discrepancy as the data includes figures from areas other than Temiskaming and does not reflect pesticide use in either northern Ontario nor the Temiskaming area.

Secondly, pesticide use by the agricultural sector in northern Ontario is small when compared to the use in other areas of the province. Statistics on pesticide use have been compiled and are published in the OMAF publication entitled "Survey of Pesticide Use in Ontario, 1978". The total quantity of herbicides used in northern Ontario is listed as 16,004 kg. and this represents only 0.37% of the total herbicide use in the province. Similarly, 2,619 kg., or 0.42% of the total quantity of insecticides, were used in the north.

In addition to the six organizations listed in the Report, the following groups should have been included:

1. Trans Canada Pipeline
2. Northern Central Gas
3. Municipalities
4. Farmers
5. Greenkeepers (golf courses)
6 Homeowners

These important additions to the list of pesticide users in northern Ontario would alter the ranking of the three most widely used pesticides. The adjusted ranking would probably be as follows:

a. 2,4-D
b. picloram; and
c. aminocarb

Statistics compiled by the Ministry of Agriculture and Food indicate that phenoxy herbicides accounted for 61% of the total herbicide use in agriculture in northern Ontario, and this was applied mainly in the Temiskaming district.

Specific Pesticide Information:

The T.E.A.C. researchers have compiled specific information on only three pesticides. Two of these, Matacil and Sevin, are insecticides and the third, 2,4-D, is a phenoxy herbicide. This section of the Report is poorly presented and is not representative of the existing scientific literature. Additional information is needed to provide readers with a more accurate assessment of health and environmental hazards associated with the use of Sevin, Matacil and 2,4-D.

The Carbamates - Sevin and Matacil:

The information outlined in the Report relating to federal registration and the use of these products in Ontario is confusing and needs to be clarified.

Sevin (carbaryl) has been registered federally as an acaricide, insecticide, and growth regulant for use in forests, on fruit crops, vegetables, field and forage crops, and ornamentals.

Matacil (aminocarb) has been registered by the federal government as an insecticide for the control of spruce budworm in conifer forests. It has been assigned to the 'restricted' category, along with all other pesticides registered for forest management. Matacil is subject to permit requirements under provincial legislation.

The Ontario Pesticides Advisory Committee has placed products containing carbaryl into Schedule 2, 3, and 4 or 6, depending on the strength of the active ingredient. This action allows carbaryl to be used by agriculturists, licenced exterminators, registered custom sprayers, as well as less concentrated formulations for use by homeowners in Ontario.

O.P.A.C. has placed products containing aminocarb into Schedule 5 for use in forestry by licenced exterminators. The aerial application of aminocarb for spruce budworm control is controlled under permit, and each individual application is assessed by district M.O.E. officers before approval is granted.

The Report briefly explained the action of carbamate insecticides but did not include the fact that the inactivation of the enzyme, acetyl cholinesterase, can be rapidly reversed. This is an important factor when treating persons suspected of carbamate poisoning. Once the patient has been removed from further exposure to the compound, recovery is usually rapid; there are usually no serious after effects, provided that renewed exposure is avoided.

Toxicity:

The term, Lethal Dose 50% (LD_{50}) is accurately defined, but the Report does not emphasize that these values are used to measure the relative toxicity between chemicals in laboratory animals. The Federal Government and the Ontario Pesticides Advisory Committee use the LD_{50} values as one of the criteria for classifying pesticides and, in so doing, place chemicals of similar toxicity into one category. The formulating and proper tank mixing reduces the toxicity of these chemicals considerably.

Persistence and Breakdown Products:

The persistence, metabolism and environmental impact of carbaryl, aminocarb and other carbamates have been studied very thoroughly. The scope of this review does not permit a detailed account of all published material. The reader is referred to a recent text by Kuhr and Dorough, 1976[1] for a comprehensive review of the carbamates, and a paper by Sarah H. Leonard, 1979[2] summarizing much of the existing literature on aminocarb.

The majority of published material indicates that carbaryl is metabolized rapidly by both plant and animal systems. In plants carbaryl is detoxified, dissipated or stored, and in animals it is detoxified and excreted. Carbaryl is stable in storage but short-lived in the field. Depending on environmental conditions it has a half-life of 3 to 4 days on plant foliage, 7 to 9 days in soil, and 1 to 5 days in water.

The Newfoundland Medical Association Committee formed to review the medical aspects of Matacil reported the following:

1. Studies involving prolonged high doses of aminocarb to mammals have not shown any significant carcinogenic, mutagenic, or teratogenic effects, nor has chronic neurotoxicity been found.

2. There was no decrease in the organism's ability to metabolize and excrete the material in these same studies.

3. Aminocarb is rapidly degraded by biological systems and there is no evidence that it is stored or concentrated in the food chain.

The no-effect level (dose level below the lowest dosage producing observable adverse effects) for acute cholinesterase inhibition in the rat has been reported to be 2 mg/kg body weight. Dr. Claire Franklin, Health and Welfare Canada, has reported that the no-effect level for aminocarb by oral administration is 7.5 mg/kg body weight. Considering these no-effect levels in rats, that the average person weighs 60 kg and that only 42.6g of Matacil are used per acre, the risk associated with human exposure is very low.

Reye's Syndrome:

Medical researchers have been investigating the causes of Reye's syndrome since it was first described in 1963. Several theories have been postulated, including viruses, exogenous toxins and pesticides, as possible etiological agents. The majority of recent reports indicate there is strong evidence to support the association of Reye's syndrome with influenza B infections. The role of chemicals in potentiating human viral infections and Reye's syndrome has not been established and investigative studies are continuing.

The Federal Department of Health and Welfare and the Newfoundland Medical Association have reviewed the health aspects of Matacil, including its relation to Reye's syndrome. Both have reported that aminocarb, nonyl phenol, and all inert ingredients in the spray mixture are unlikely to have any significant etiological role in Reye's syndrome. Although knowledge of the causes of this disease is limited, decisions for the banning of a chemical must be based on the available scientific data. So far, no relationship between the use of Matacil and Reye's syndrome exists.

2,4-D:

The information presented in the Report on 2,4-D is totally inaccurate and misleading. 2,4-D was discussed together with the compounds 2,4,5-T and 2,4,5-TP, but no clear indication was given of the similarities and differences between these chemicals.

2,4-D, 2,4,5-T, 2,4,5-TP - WHAT ARE THEY:

2,4-D is a chlorinated phenoxy compound used to control annual and perennial broadleaf weeds in cereals, and for weed control in lawns, pastures and aquatic situations. 2,4,5-T, either alone or in combination with 2,4-D, was the most important brush control treatment for use on roadsides and power lines. Its importance relates to the fact that it is the most active of all phenoxy herbicides on the greatest number of woody species. 2,4,5-TP was also used for brush control in certain situations because it was more effective on certain species of oak, ash and hickory.

The action of 2,4-D and other phenoxy compounds was described in the Report, but the fact that these are selective compounds was omitted. This is the prime reason for their effectiveness in controlling weeds. Phenoxy herbicides are much more toxic to herbaceous broadleaved plants than to grasses and much more toxic to deciduous trees than to evergreens or conifers.

TOXICITY AND HUMAN HEALTH CONCERNS:

Phenoxy herbicides have been used for more than thirty years and no serious adverse effects to man or animals have been reported. The main concern with phenoxy use is the possible damage to nearby susceptible plants, including field crops, vegetables, flowers, grapes, fruit trees and ornamentals.

REVIEW OF 2,4-D:

Scientists in Agriculture Canada and Health and Welfare Canada have thoroughly researched the world scientific literature on 2,4-D. This review centred mainly on health and safety aspects, and included the critical appraisal of some 120 scientific papers from more than 20 countries. The federal government has reported that "no substantial evidence of harm associated with the proper use of 2,4-D for applications registered under The Pest Control Products Act has been found". Both agencies are continuing to monitor all scientific literature.

The Environmental Protection Agency (E.P.A.) has also begun a similar scientific review of 2,4-D in the United States. Following this review, E.P.A. will be requesting additional information from manufacturers in the areas of oncogenicity (tumor-induction), reproductive effects (particularly effects to the fetus) and metabolism in animals. E.P.A. is permitting the continued use of 2,4-D while they decide what additional studies are required.

IS 2,4-D A CARCINOGEN?

Dr. Melvin Reuber of the National Cancer Institute[3] has reviewed the following studies on the carcinogenicity of 2,4-D:

a) a 2,4-D rat feeding study by FDA (1964)[4];
b) a 2,4-D dog feeding study by FDA (1963)[5]; and
c) mouse studies with 2,4-D by Innes et. al. (1969)[6].

Dr. Reuber's interpretations do not agree with the results and conclusions reported in the studies. However, these studies and many others have been reviewed by numerous experts and government agencies throughout the world and all of the reviewers, except Dr. Reuber, have found that there is no basis for the conclusion that 2,4-D is a carcinogen.

2,4-D AND BIRTH DEFECTS:

Tests have been conducted on rats, mice and hamsters to evaluate the possible reproductive effects of 2,4-D. Almost all animal tests conducted on the potential reproductive effects of 2,4-D show that there is a no-effect level for injury to the fetus (feto-toxicity) from 2,4-D. The no observable effect levels are such that large margins of safety exist for workers using 2,4-D.

The evidence available to date indicates that 2,4-D does not contain any form of dioxin. This includes the tetra chloro-dioxin (TCDD), which is a trace contaminant produced in the manufacture of 2,4,5-T.

2,4,5-T AND 2,4,5-TP:

The herbicides 2,4,5-T and 2,4,5-TP were placed in a special use permit category in 1979 by the Honourable Harry Parrott, Minister of the Environment. The Minister suspended issuance of permits for the two chemicals to allow scientists in government, universities and elsewhere to thoroughly review the E.P.A. 1979 study linking forest spraying with 2,4,5-T and spontaneous abortions in women living near Alsea, Oregon[7]. All reviewers have discredited the Alsea II study on the basis that it contains serious deficiencies. This study is not scientifically valid.

Pesticide Drift:

The information on pesticide drift is limited and does not provide an accurate assessment of the positive and negative factors. Many papers have been published on this topic but the Report discusses only one paper, a study by J. A. Armstrong 1977 [8]. Armstrong investigated the relationship between the rates of pesticide application and the quantity deposited on the forest, but much of the data and his interpretation of the data is not presented. Armstrong's study emphasized the difficulties associated with measuring spray deposit and the limitations imposed on any study when using sample collectors. Fir and spruce trees are themselves excellent collectors of small droplets and, therefore, the apparent loss of 50% of the emitted spray is misleading. In reality, more impinges on the target and we do not have large amounts of spray drifting through the air.

The statements presented in the Report suggesting that spray droplets could travel to Ester Provincial Park and/or Kirkland Lake should not be included. The aerial application of pesticides varies with each operation, and general statements, such as those above, serve only to confuse the issue of insecticide application.

The Ministeries of Natural Resources and Environment will be conducting air-monitoring tests near Kirkland Lake after forest spraying with Matacil. The results of these studies will aid in providing an accurate assessment of the movement of spray particles.

Synergism:

The term 'potentiation' can be used to describe "the phenomena observed when a compound, although having no direct toxic effect per se at the dosage employed, is able to substantially enhance the observed toxicity of another substance with which it is combined" Statham and Lech 1975[9]. This term has been used by several authors to describe both synergism and potentiation, and in this discussion the terms are considered to be synonymous.

The synergistic effects of chemicals is a very broad subject and one that is just beginning to be studied. Most of the studies deal with drugs which are administered in large dosages and produce measurable effects. Few drugs have produced synergistic effects when administered in small doses. The results arising from these studies are still speculative and are not developed to an extent on which to base government policies or control.

At present, the study of synergistic effects of chemicals must be limited to those compounds which produce observable effects since the scientific techniques required to measure minor changes have not been developed.

Individuals are exposed to several hundred compounds throughout their daily activities. The concentration of these chemicals, including pesticides, is so low that synergistic effects are unlikely to present a problem.

M.O.E. Responses to T.E.A.C. Recommendations Concerning Pesticides

The Ministry of the Environment has responded to each of the T.E.A.C. recommendations in the same order as they appear in the Report.

Matacil:

1. The Ministry of the Environment has reviewed the existing scientific literature on Matacil (aminocarb) and nonyl phenol and does not feel any change in the regulation of Matacil is justified. The Federal Department of Health and Welfare and the Newfoundland Medical Association have reviewed the health aspects of Matacil, including its relation to Reye's Syndrome. Both have reported that Matacil, nonyl phenol and the inert ingredients in the spray mixture are unlikely to have any significant etiological role in Reye's syndrome.

2. The federal government is responsible for evaluating all data submitted in support of registration of a product. The amount and type of research required for registration varies considerably and depends on the environment in which the pesticide is to be used. However, all pesticides are evaluated for oral, dermal and inhalation toxicity in both short and long term studies. Special studies involving reproductive, teratogenic, mutagenic and carcinogenic effects on mammals are also considered in this evaluation process.

3. The chemistry of aminocarb has been reviewed recently by R. James Maguire (1979)[10]. In his report, he states that a number of metabolites of aminocarb have been identified to date and some research on their toxicities has been completed. Information on the breakdown products is continually being published as more is known about the chemistry of the biological and environmental metabolism of aminocarb. The Federal Department of Agriculture and the registrant, Mobay Chemicals, are currently addressing this topic.

2,4-D:

1. A complete re-evaluation of the world scientific literature on 2,4-D by the federal government indicates that there is no health hazard associated with the use of these products for applications registered under The Pest Control Products Act. For this reason, Agriculture Canada and the Ministry of the Environment do not feel any need to restrict further the use of 2,4-D.

2. Agencies and individuals normally assess the weed population in a particular area and then decide on the most suitable method of control. Control procedures may take many forms including manual and mechanical methods, biological or natural control and chemical control.

3. Applications of 2,4-D according to use patterns established under The Pest Control Products Act generate considerable data for evaluating the long term effects of these products. Persistence of the active ingredients in plant, soil and water is one of the main areas of concern in studying these long-term effects.

4. The posting of treated areas has been discussed in previous sections. In summary, posting could be achieved in certain situations, but a large scale program could not be implemented without a full review of the legal requirements.

All Pesticides:

1. The detailed testing of all pesticides previous to registration has been discussed in previous sections.

2. Information on all active and inert ingredients, including emulsifiers, solvents, diluents and dyes is submitted to the federal government in support of registration of the product. The toxicity of inert ingredients is evaluated by requiring that toxicity data on the formulated product be included in the registration submission.

3. The review and re-evaluation of pesticides is a very complex procedure involving many scientific disciplines. The present system ensures that products are thoroughly evaluated for efficacy, and human and environmental concerns. The release of information in support of registration prior to registration would not improve the evaluation of new products.

4. The recommendation that a pesticide must be evaluated for synergistic effects with all other compounds used in a particular area is not practical. Products are evaluated for toxicity and environmental concerns prior to their registration and the extensive testing of all chemicals for synergistic effects would not provide meaningful results.

CONCLUSION:

The T.E.A.C. researchers listed several objectives which they hoped to achieve in writing this Report. First, to document the complete decision-making process used by government and public service organizations in their pesticide programs in the North, and secondly, to compile a list of the most widely used pesticides in northern Ontario with specific information on the environmental and public health concerns associated with their use.

The first objective was achieved with minor weaknesses and discrepancies in the Report covered in the main text of this review. The Report reflected a good understanding of the decision-making processes and legislation associated with pesticide use. However, it must be emphasized that the decision-making processes and legislation apply to all of Ontario, and not just the northern part of the province.

The second section of the Report discussed some of the pesticides used in northern Ontario but is not a complete listing. The environmental and human health concerns raised in the brief are not supported by the existing literature. Matacil and 2,4-D have been evaluated by Agriculture Canada and the Ministry of the Environment and both agencies cannot find scientific evidence to support such claims. For this reason, these control agencies are not justified in further restricting the use of these compounds.

The Ministry of the Environment realizes that pesticide use is not supported by all individuals. Communication channels currently exist whereby concerned citizens may make their personal opinions known, and thus there is no need to implement formal channels of public review and involvement.

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Royal Commission
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July 9, 1980

MINISTRY OF
THE ENVIRONMENT
JUL 14 1980
PESTICIDES CONTROL
SECTION

Mr. D. Wilson
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40 St. Clair Avenue West
Toronto, Ontario

Dear Mr. Wilson:

As part of the mandate of this Commission, a public funding program was instituted to allow individuals and groups to prepare submissions related to current problems, issues and areas of concern in Ontario North of 50°. One such submission by the Temiskaming Environmental Action Committee entitled:

Pesticide Use in Northern Ontario and Recommendations for Public Participation in the Decision Making Process

is enclosed As part of our internal review of the report I would appreciate a review by yourself and the personnel of your office concerned with pesticide research, application, environmental effects and controls as they relate to your areas of responsibility. It is the aim of the Commission to allow wider dissemination of the report through publication, and we feel that a review by your office of the information presented is most appropriate.

Your response may take one of two forms at your option. It could be in the form of an informal response in which case it would be placed in the Commission file on this submission, or it could take the form of a formal submission in which case it would be printed and placed in depositories located throughout the province. It should be remembered that the contents of the report are the responsibility of the author and are not attributable to the Commission. Should you require additional information, please do not hesitate to give me a call.

I look forward to receiving your comments.

Yours sincerely,

Stephen Rimmer

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Pesticide Use In Northern Ontario
and
Recommendations for Public Participation
In The Decision-Making Process

PREPARED FOR
THE ROYAL COMMISSION ON THE NORTHERN ENVIRONMENT

by H. Ingwersen & F. Patterson
of Temiskaming Environmental Action Committee

PESTICIDE USE IN NORTHERN ONTARIO

AND

RECOMMENDATIONS FOR PUBLIC PARTICIPATION

IN THE DECISION-MAKING PROCESS

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OF TEMISKAMING ENVIRONMENTAL ACTION COMMITTEE

Acknowledgement

The writers of this report as members of the Temiskaming Environmental Action Committee wish to acknowledge the financial support of the Royal Commission on the Northern Environment. We would also like to express our appreciation for the co-operation given by Agriculture Canada, Health and Welfare Canada, the Ministry of the Environment, Ministry of Natural Resources, Ministry of Agriculture, Ontario Hydro and other services using pesticides. We would also like to thank Citizens for Quality Environment, Sioux Lookout for sharing their ideas and information with us.

Table of Contents

		Page
Introduction		1
Part 1	Regulation and Use of Pesticides	2
Chapter 1	Federal Regulation	2
	- Pest Control Products Act	2
	- Other Federal Acts	2
	- Pesticide Registration Process	3
Chapter 2	Provincial Regulation	5
	- Pesticides Act	5
	- Environmental Assessment Act	7
Chapter 3	District Pesticide Users and the Decision-Making Process	8
	-Users' responses to questionnaire	9
Chapter 4	Recommendations for Public Participation	23
	- Federal Recommendations	23
	- Provincial Recommendations	27
	- Local Recommendations	29
	- Enforcement of the Pesticides Act	30
	- Anecdotes of Personal Experiences with Pesticide Programs	31
Part II	Pesticide Use in Northern Ontario	33
	- Chart of 1979 Pesticide Use in Temiskaming	34
Chapter 1	Specific Pesticide Information	33
	- The Carbamates	33
	- Toxicity	35
	- Persistence and Breakdown Products	35
	- Long Term Research	35
	- Viral Enhancement and Reyes syndrome	36
	- Carbamates and Non-Target Organisms	36
	- Fish	37
	- 2,4-D - What is it?	37
	- Toxicity	37
	- Is 2,4-D a Carcinogen	38
	- 2,4-D and Birth Defects	38
Chapter 2	Pesticide Drift	39
Chapter 3	Synergism	42
Chapter 4	Recommendations concerning Pesticides	45
	References	63

Introduction

With financial assistance from the Royal Commission on the Northern Environment, the Temiskaming Environmental Action Committee employed two full-time researchers and one part-time secretary for a period of fifteen weeks. The purpose was to:

1. document the complete decision-making process used by government and public service organizations in their various chemical spraying programs in northern Ontario and to propose alternatives whereby people who live in or near these sprayed areas can be more directly involved in this decision-making;

2. to compile a list of the chemical sprays most widely used in northern Ontario and to gather research and information relating to the environmental and public health impact of each of these sprays. Material on drift of chemical sprays was also compiled.

In the course of our research on this very broad subject, we found that the time limit imposed did not allow us to encompass all of northern Ontario in our research. Hence, our information on decision-making and pesticide use is somewhat regionalized. We adhered to the Temiskaming District, since that is our home base, and in most cases it is fairly representative of the whole of northern Ontario.

In a world that seems to be increasingly centralized and in the control of a few, distant people, TEAC feels that it is important for the average person - the farmer, the shop keeper, the housewife, interested and concerned citizens, to be able to directly participate in decisions that ultimately affect the environment in which they live. This is especially important in northern Ontario, where people are alienated from the distant capitals of Ottawa and Toronto, places where decisions are made that sometimes have a grave impact on the people of the North.

This project and subsequent booklet is an attempt to make the decision-making process, as it applies to various chemical spraying programs in the North, easier for people to understand. The main thrust, however, is to explore avenues where public input can not only be achieved but can play an important role in giving people more control over their environment.

Part II of this booklet is an information section on the pesticides most widely used in northern Ontario, and a bit of information on each of them condensed from our research.

Part I: Regulation and Use of Pesticides

"Pesticide" means any organism, substance or thing that is manufactured, represented, sold or used as a means of directly or indirectly controlling, preventing, destroying, mitigating, attracting or repelling any pest or of altering the growth, development or characteristics of any plant life that is not a pest and includes any organism, substance or thing registered under the Pest Control Products Act (Canada).[4]

Before we can approach the subject of chemical spraying in northern Ontario, we must first answer the question: - who legislates and controls the use of pesticides in Canada?

Chapter 1 - Federal Regulation

A. The Pest Control Products Act (P.C.P. Act) administered by Agriculture Canada is the principal federal legislation that governs the sale and use of pesticides in Canada. The intent and philosophy of the P.C.P. Act is expressed as follows: "No person shall manufacture, store, display, distribute or use any control product (pesticide) under unsafe conditions".

The remainder of the act written thereunder is oriented to provide authority to achieve that intent. Any pesticide that is used in Canada must be registered under the P.C.P.Act Each pesticide's registration mainly consists of conditions under which it can be sold and the purposes for which it may be used.

B. Other Federal Acts as well as the P.C.P. Act, which regulate and limit the use of pesticides in special situations are:

Food and Drugs Act - administered by Health and Welfare Canada, it prohibits the sale of food that has in or upon it, harmful or poisonous substances. The Foods Directorate of Health and Welfare Canada determines maximum residue limits of pesticides on foods.

Environmental Contaminants Act - through this act, Health and Welfare and Fisheries and Environment Canada can demand specific data relating to use, sales, manufacture or import of an environmental contaminant, and "conduct reviews in respect to its environmental or human health hazard". On the basis of these reviews, the Governor-in-Council can take necessary actions to regulate or limit the use of a

chemical that poses a hazard and is not already governed by existing laws. This act is mainly designed as a back-up to federal and provincial laws (such as the P.C.P.Act) that don't have adequate powers in special situations.

Fisheries Act - administered by Environmental Protection Service, Fisheries and Environment Canada. It prohibits the deposit of deleterious substance of any type in water frequented by fish.

The Migratory Birds Convention Act - is also administered by Fisheries and Environment Canada. Similar in its scope to the fisheries Act; it prohibits the deposit of oil, oil wastes, or any other substances harmful to migratory birds, in any waters or any area frequented by migratory birds.

The Northern Inland Waters Act and the Arctic Waters Pollution Prevention Act - is administered by the federal Department of Indian and Northern Affairs, both these acts relate to the maintenance of water quality and prohibition of discharge into designated waters of any substance that would degrade or alter the quality of those waters to an extent that it is detrimental to their use by man or by any animal, fish or plant that is useful to man.

These are just a few of the many federal acts that are designed to protect the environment and human health from the unsafe use of pesticides and chemicals.

C. Pesticide Registration Process

As mentioned before, the conditions for sale and use of any pesticide, whether it be used for forestry, industry, agricultural, public health or domestic situations, are set forth in the pesticide register under the Pest Control Products Act.

For any given pest control product, industry must submit an application for registration along with adequate support-scientific data to facilitate evaluation of the product in respect to merit and safety. The degree and type of data necessary for registration depends on the individual pesticide and its proposed use, and is characterized in Section 9 of the P.C.P.Act. Often, government departments actively take part in the research and development of pesticides that are not yet registered for use but must go through such testing in order to be registered. For instance, the Forest Pest Management Institute (FPMI) of Fisheries and Environment Canada conducts experimental field trials on pesticides that are undergoing the process of registration

for forestry use. Among other things, FPMI would test the proposed products' efficiency in destroying the target insect or disease.

Copies of the industry's submission, supporting research and all, are provided, with a request for review and comment, to:

1. Agriculture Canada
2. Health and Welfare Canada
3. Fisheries and Environment Canada

Depending on the proposed use of the pesticide, other consulting government agencies, such as the Wildlife Management Branch of Environment Canada or the Bureaus of Chemical Safety and of Chemical Hazards of Health and Welfare Canada, will also be asked to take part in the review of this data for registration. This interdepartmental review process is the main avenue for dealing with environmental and human health concerns in the use and application of pesticides that are being considered for registration. Each of the three main government agencies involved in this registration process have distinct duties.

1. Agriculture Canada

Control Products Section - this section of Agriculture Canada receives the registration application and is responsible for the co-ordination of reviews from all of the other departments. Being responsible for the application for registration of any pesticide, this section communicates with the applicant as to whether or not his product meets the requirements for registration.

Research Branch - contributes to Agriculture Canada's evaluation process of candidate pesticides by developing data on efficacy, crop safety, and residues on food crops.

2. Health and Welfare Canada

Health and Welfare also plays an important role in the evaluation of pesticides for registration. They have two main areas of concern:

Environmental Health Directorate - is concerned with human health aspects of people employed in manufacturing, handling or applying pesticides, as well as anyone who may become exposed.

Foods Directorate - ensures that the use of pesticides on food crops will not result in undue hazard due to pesticide residues on crops. They also establish maximum pesticide residue limits on food crops.

3. Fisheries and Environment Canada

Fisheries and Environment also plays an important advisory role in pre- and post-registration evaluation. Their areas of concern are:

- the effects of products on fisheries, aquatic life, wildlife, birds and other non-target biota;
- efficacy in controlling target insects and diseases (forestry use);
- adequacy of disposal instructions.

Depending upon review of all of the submitted data by various branches of these three main agencies, evaluation officers in the Control Products Section of Agriculture Canada let the applicant know whether the proposed pesticide passes or fails the tests for registration. It is not unusual that despite the submission of comprehensive data, the registration of any given pesticide for some or all uses may be refused. Unfortunately there is no publication mechanism to document such cases, since it is a matter of negotiation between the registrant and regulatory officials.

D. Re-evaluation

Pesticides that are registered are subject to re-evaluation in the light of new information during the life of the product. Once a product has been registered and used, the scope of any re-evaluation process is expanded to include provincial agencies. Because of this provincial involvement, re-evaluation involving long-registered products is complex and time-consuming.

Chapter 2 - Provincial Regulation

A. The Pesticides Act, 1973 - The provincial government regulates pesticides largely through the Pesticides Act, passed in 1973. The Act is administered by the Pollution Control Branch of the provincial Ministry of the Environment. It may be divided into two sections, prohibitory and regulatory. The prohibitory section sets up a general prohibition which, in essence, prohibits anyone, licensed or unlicensed, with or without a permit, to discharge or cause to be discharged, a pesticide into the environment in such a manner that would cause greater impairment to the environment (if any) than would result from the proper use of the pesticide.[2] Other prohibitions found in the regulations are that water may not be taken from a lake or river unless the equipment is equipped with an effective backflow device; pesticide applying equipment may not be washed in any lake, river or surface waters; no one may store pesticides in any manner where they may come into contact with food or drink

intended for human or animal consumption; anyone responsible for a pesticide must immediately notify the Director of the Pollution Control Branch (Pesticides Control Section) of the Ministry of the Environment of any theft, fire or accident that may release a pesticide into the environment.[3]

The Ministry of the Environment controls the pesticide situation by regulatory provisions set forth in The Pesticides Act. These regulations set up a classification of pesticides and a system of licences and permits to use or sell them. These regulations also create regulatory bodies to administer various aspects of the Act. A licence and/or a permit may be required to use or sell a pesticide based on its classification. Only those pesticides approved and registered under the federal Pest Control Products Act may be used in Ontario. It is through these licences and permits that records of sale and use are kept and applicants must undergo some training to pass an examination, hence some control is exerted; however, under each licence/permit combination there are exemptions. These exemptions are mostly in the agricultural area particularly where the application is performed by the farmer.

The Director of the Pollution Control Branch (Pesticides Control Section) issues and revokes these licences and permits. The Director may also issue stop orders, control orders and other orders such as ordering the person responsible for the pesticide to clean up any spill or other accidental damage.

i) Pesticides Advisory Committee - The pesticides Act creates a Pesticides Advisory Committee. This committee classifies pesticides based on the toxicity of the active ingredient, its use and its environmental impact or danger to human health. It also reviews The Pesticides Act annually and may inquire into anything concerning pesticides or the control of pests as well as carrying out research projects. Its objectives are:

1. to find alternative pesticides for those which are deemed environmentally hazardous and are restricted,
2. to determine potential environmental hazards of pesticides currently in use,
3. to reduce pesticides input into the environment.[4]

The following is from the Deputy Minister in answer to an inquiry to see if the Pesticides Advisory Committee is a point of possible participation. "There is no formal channel whereby concerned citizens or public interest groups may make submissions to the Pesticides Advisory Committee. However, members of the public could ask the Committee to reconsider a pesticide, by submitting a brief to them or by requesting permission to address one of their meetings. There does not appear to be any precedent for this procedure,

but in theory, there is no reason why the Pesticides Advisory Committee would refuse such a request, if they were convinced that new scientific evidence might come to light as a result. The Pesticides Advisory Committee is concerned with the scientifically documented effects of a pesticide, and they would be most likely to consider briefs or submissions from the public if they contained or referenced firm scientific evidence."[5]

ii) Pesticides Appeal Board - The Pesticides Act creates a Pesticides Appeal Board. This is where an applicant may appeal the decision of the Director of the Pesticide Control Section to refuse to issue or renew a licence, to suspend or revoke a licence or make a control order.

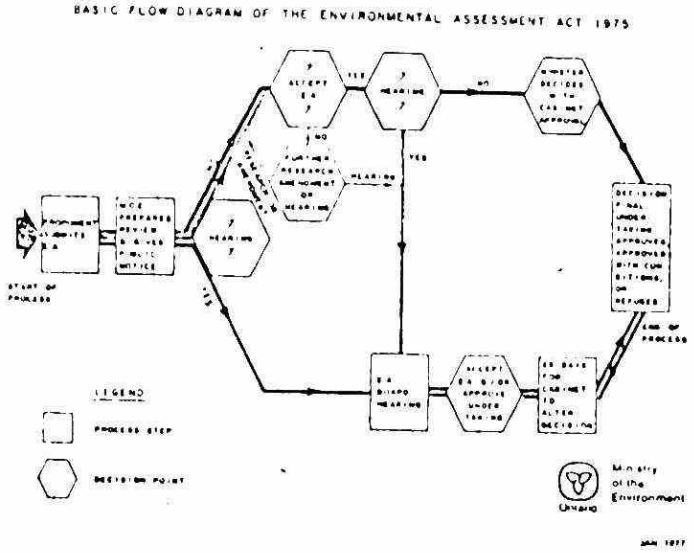
B. Environmental Assessment Act - passed in 1975 and fully proclaimed in 1976, is an innovative and complex piece of legislation. The purpose of this act is to include, in the planning stage of a project, a type of risk/benefit analysis of the project from the point of view of social costs, potential environmental disturbance or effect on human health. A similar assessment must be done for potential alternatives to the project as well. The point being to prevent significant environmental disturbances rather than pay the direct or indirect costs of remedial action or the consequences of no remedy.

At this point it would appear that its potential has yet to be fully realized because of the number of exemptions. These exemptions are too numerous and legalistic to quote in this report, but with respect to the use of herbicides and pesticides, the spray programs of such services as Ontario Hydro, Ministry of Transportation and Communication, Bell Canada and others are exempt because they are of the nature of a maintenance undertaking rather than a major undertaking. Agricultural spraying is exempt because for the most part it is in the private sector which has not yet been brought under the Act. It would appear that the only spray programs to come under the Environmental Assessment Act are those of the Ministry of Natural Resources. These were exempted until December, 1979 and at that time this exemption was further extended to December, 1980. To determine whether a project needs an environmental assessment it is adviseable to call the Ministry of the Environment, Environmental Assessment Section, Toronto.

When the assessment has been submitted and the review of it by the government of Ontario completed, notice is then given to the public after which any interested party has thirty days, or more if specified in the notice, to make a submission concerning the assessment or the project, they may also request a hearing. At this point the Minister then determines whether the project should be

approved, amended or if sufficient need for a hearing has been demonstrated.

If a hearing is required the project details and relevant information is submitted to the Environmental Assessment Board. A public hearing will then be held, however the Minister has the power to rule that some information or part of the hearing be kept secret. The Board then decides to accept, amend or reject approval of the project; however, within twenty eight days the Minister and the Cabinet may amend or reject the decision of the Board. They may also request another hearing. Below is a basic flow diagram of this procedure.



Chapter 3 - District Pesticide Users and the Decision-Making Process

In 1979 there were over six government and public service agencies that carried on pesticide spraying programs of any size in the District of Temiskaming. In order to document the decision-making processes used by these agencies in their various spraying programs and to gather information on the most widely used pesticides, TEAC sent a questionnaire (attachment #1) to each of these agencies.

The following are the unabridged replies of each of these agencies concerning their decision-making processes.

Attachment 2.) Ministry of Natural Resources
" 3.) Ministry of Transportation & Communications
" 4.) Northern Telephone Ltd.
" 5.) Ministry of Agriculture and Food
" 6.) Ontario Northland Transportation Commission
" 7.) Ontario Hydro

Attachment 1.)

TEAC
Henry Ingwersen
R.R. 2
Konabeek, Ontario P0J 1M0

Robert J. Keir
Information and Liaison Section
Ministry of Natural Resources
5th Floor, Whitney Block
Queen's Park
Toronto, Ontario M7A 1W3

Dear Mr. Keir;

With financial assistance from the RoyalCommission on the Northern Environment, TEAC is documenting the complete decision making processes used by the MNR and other branches of government in their various chemical spraying programs in Northern Ontario. We will consequently be proposing alternatives whereby the people who live in or near these sprayed areas can be more directly involved in these decision making processes.

In order to achieve this objective, we need the full cooperation of the MNR in supplying us with the necessary information. What is required can be broken down into 2 basic areas:

1- DECISION MAKING PROCESS

A. What group or body within the MNR decides which insecticides and herbicides to use for the Spruce Budworm and conifer release programs in Northern Ontario?

B. On what do they base these decisions?
1) what research is consulted
2) who is consulted

C. Does this same body decide what areas require chemical spraying, and on what do they base these decisions? (B above)

D. How many are on this decision making body?
1) who are they
2) how are they put there
3) if appointed, who appoints them.
4) how long do they serve
5) how often do they meet

E. In general, what is the complete, step-by-step process implemented by this body in deciding each years' herbicide and insecticide spraying program?

F. To what extent are the various chemical companies involved in this decision making process?
1) are they consulted?

Attachment 1.)

(2)

2- Herbicide and Insecticide Information

A. What herbicides and insecticides are considered for use in the MNR chemical spraying program in Northern Ontario?

B. From which chemical companies are the various herbicides and insecticides purchased?(2,4-D and "Matacil")

C. Does the MNR establish multi-year contracts with these chemical companies for the purchase of certain herbicides and insecticides?

1) which herbicides and insecticides?
2) what is the usual longthbof these contracts?

D. Since the MNR chemical spraying program began, what herbicides and insecticides have been used in Northern Ontario?

1) what years were each of these pesticides used?
2) what were they used for?
3) what amount was used of each of them each year?
4) how many acres were sprayed each year?
5) the rate of application (per acre) of each one used each year.
6) where was each pesticide used each year? (how much in Temiskaming, how much in Cochrane, etc.)
7) how were each of these pesticides applied each year?(plane, helicoptor, ground spraying, etc.)
8) what was the cost of each of these spray programs each year?
9) what sort of environmental and health impact studies were conducted each year in any of these target areas following the spraying?
10) what was the cost each year of these studies?

B. What is the MNR's plan for the 1980 chemical spraying program in Northern Ontario?

1) what herbicides and insecticides will be used?
2) how much of each will be used?
3) how many acres will be affected in each of the separate programs?
4) what will be the application rate of each of the pesticides?
5) how will each pesticide be applied?
6) how many acres will be affected in each area by each program? (Temiskaming, Cochrane, etc.)
7) when will each spray proram be expected to begin?

Attachment 1.)

(3)

8) what will be the total cost of each of the spray programs?

F. What alternatives to the chemical spraying program are currently under consideration by the MNR? (sex attractants, biological controls,etc.)
1) how much research is going into these alternatives?
2) what alternatives have been considered in the past and discarded?

G. Is the MNR studying the synergistic effects of pesticides in the environment?

We appreciate your cooperation in answering all of these questions as thoroughly as possible.If you have any questions or comments concerning this letter please phone (705) 563-2404.

Sincerely,

Henry Ingwarson
TEAC

Ministry of Natural Resources

Attachment 2.)

RESPONSE TO QUESTIONS ON DECISION-MAKING IN CHEMICAL SPRAYING PROGRAMS RAISED BY TEAC

1. Decision Making Process

A. Fundamentally, the registration process of Agriculture Canada determines which pesticides may be used. Within MNR, the choice as to which herbicide to use is made by field staff, based on their own experience and advice from the Pest Control Section in Head Office. For spruce budworm spray programs, the Pest Control Section decides which insecticides will be used.

B. Decisions are based on: (a) effectiveness, (b) environmental risk (c) cost (d) ease of use in field.

(1) Research conducted by the Canadian Forestry Service, various provincial forest management agencies, the U.S. Forest Service, universities, etc. is reviewed and evaluated continually. Publication lists and subscriptions to appropriate scientific journals facilitate this review.

(2) Frequent meetings are held throughout the year involving representatives from provincial and federal pesticide regulatory agencies, universities, fish and wildlife, agriculture, health, forestry, etc. to review recent research and discuss the status of various pesticides. On a regular basis, scientists from the Canadian Forestry Service, Ontario Pesticides Advisory Committee, Health and Welfare Canada and Agriculture Canada are consulted on the subject of pesticide effectiveness and hazards.

C. To a large extent, decisions on areas to be sprayed with herbicide for conifer release are made by the unit forester. He may or may not consult with the district forest management supervisor and/or the regional forester in making this decision. For spruce budworm spraying, the decision is made by the Spruce Budworm Committee. Delineation of the area to be treated is based on what area requires treatment biologically to achieve conifer release or protection from budworm.

D. (1) There is no decision-making body for herbicide treatments. For budworm spraying, the body is the Spruce Budworm Committee, made up of representatives from District, Regional and Head Office of MNR, and the Canadian Forestry Service. Non-government participation may be requested. In 1978, the Federation of Ontario Naturalists and Pollution Probe were invited to participate and observe the spraying program, but both declined.

(2) They are appointed by District Managers and Regional Directors of MNR.

(3) as above.

(4) They serve one year at a time.

(5) The Spruce Budworm Committee meets 5 to 6 times to plan the program.

E. As indicated in the covering letter it would be impossible to document on paper the "complete, step-by-step process" since the process develops in response to the demands of that particular year. Your question can best be answered by participating in the planning of the 1980 budworm spraying program.

F. (1) The companies are not involved to any extent in decision making. They are consulted only to determine product cost and availability.

Ministry of Transportation & Communications Attachment 3.)

1. DECISION MAKING PROCESS

A. What group or body within the MTC decides which herbicides to use for the weed and brush control program in Northern Ontario?

Under the Director of Maintenance the Landscape Planning and Operations Section researches and recommends various herbicides to the Ministry's New Products Committee for their approval. Following approval, the recommendations are implemented through MTC's "Pesticide Spray Manual".

B. On what do they base this decision?
1) What research is consulted?
2) Who is consulted?

Before any new herbicide is considered for use by the Ministry we will carry out trial treatments to monitor the efficacy of the product, safety to the environment and the spray applicator, method of application and cost etc. These trials may be carried out and monitored over several years before recommendations on their further use are submitted to our New Products Committee.

1) Research and development work of other highway and utility agencies across Canada and the U.S. is reviewed. The Department of Environmental Biology, University of Guelph is frequently consulted on related herbicide research. Various university, government and professional association publications and journals (such as Weed Science Society of America) are continually reviewed. Product memoranda from Agriculture Canada are also reviewed to keep abreast of registration changes.

2) Frequent consultation occurs with the Plant Products Division of Agriculture Canada, the Ontario Ministry of the Environment, Ministry of Agriculture and Food, the Pesticide Advisory Committee and the Ontario Weed Committee (OWC). MTC has a representative on the OWC.

C. Does this same body decide which areas require chemical spraying, and on what do they base this decision? (B above).

The decision on which areas are to be sprayed is made in the local MTC District office following guidelines from the MTC Quality Standards and the MTC Pesticide Spray Manual. Consultations on the spray techniques and the specific spray materials to be used are carried out between the Districts and Head Office resource staff. As required by the Ministry of the Environment our Head Office also administers the requests of specific treatments by annual permits from MOE.

D. How many are on this decision making body?
1) Who are they?
2) How are they put there?
3) If appointed, who appoints them?
4) How long do they serve?
5) How often do they meet?

The Regional decision making process with respect to the area herbicide program involves a multi-disciplinary team of M. T. C. employees.

1) It is composed of (i) Regional Maintenance Engineer (ii) District Engineer (iii) Services Supervisor (iv) Landscape Foreman (vi) Patrolman.

2,3,4,5) The above staff is an integral part of the District and Regional Maintenance organization who plan, develop and execute maintenance procedures throughout their respective Districts. The procedure is continual and ongoing.

E. In general, what is the complete step by step process used by this body in deciding each year's herbicide spraying program in Northern Ontario?

The process as outlined in 1-c is carried out annually in order to prepare the work program for the ensuing year.

F. To what extent are the various chemical companies involved in this decision making process?

1) are they consulted?

The chemical companies are not consulted or involved with ar decision as to the type of treatment or pesticide to be use They are consulted only for technical resource information availability and cost of their specific products.

TEMISKAMING ENVIRONMENTAL ACTION COMMITTEE

RESPONSE

Question: 1. A. What group or body within Northern Telephone decides which herbicides to use for the weed and brush control program in Northern Ontario?

Answer: The "Construction Manager" in conjunction with a licenced "Forestry Foreman" decide on the chemicals to be used for brush control within our system.

Question: 1. B. On what do they base this decision?

Answer: The decisions are based on information obtained from the various Chemical Companies, the "Ministry of the Environment", verbal communications with the Ontario Hydro forestry group and also with the Ministry of Transportation and Communications.

Question: 1. B. 1) What research is consulted?

Answer: Northern Telephone Limited does not have a research group and depends on the Chemical Companies and the various Ministries for information.

Question: 1. B. 2) Who is consulted?

Answer: Mainly the "Ministry of Environment".

Question: 1. C. Does this same body decide which areas require chemical spraying, and on what do they base this decision (B above)?

Answer: The Construction Manager and the Foresty Foreman decide on the areas to be sprayed, from information received from the line maintenance forces along with data from the past spraying program. A visit is usually required in a lot of cases to help determine if it can be sprayed if brush is too high, it must be cut and chipped or hauled away.

Question: 1. D. How many are on this decision making body?

Answer: There really is no formal appointed committee. It is up to the local maintenance people to recommend any line clearing or spraying required in their respective areas. This information is channeled to the Construct Manager or Forestry Foreman, a preview is made and the program is then set up, taking into consideration the required, whether brush or spray and also future construction area.

Question: 1. E. In general, what is the complete step by step process implemented by this body in deciding each year's herbicide spraying program in Northern Ontario?

Answer: We know the areas that have been sprayed in the past and the local maintenance foremen in his normal visits during the summer months will make recommendations of brushing or spraying requirements. If an area requires spraying this is then scheduled from June 1 to the end of August.

Question: 1. F. To what extent are the various chemical companies involved in this decision making process?

Answer: The chemical companies have no input on deciding where or what is sprayed. They may be asked to recommend chemicals for various types of undergrowth.

Attachment 5.)

Ministry of
Agriculture
and Food

416/965- 1241

Legislative Buildings
Queen's Park
Toronto, Ontario
M7A 1B2

November 22, 1979

Mr. Henry Ingwersen
Temiskaming Environmental Action Committee
R. R. 2
Kenabeek, Ontario
POJ IMO

Dear Mr. Ingwersen:

I am replying to your letter about information on chemical spraying in Northern Ontario.

At the outset I wish to stress that decisions to spray farm crops in Ontario are not made by Government but rather by individual farmers themselves.

They do, of course, have ready access to carefully prepared recommendations on which to make their decisions.

In this connection, I am enclosing Publications 296, 75, 363 and 360 as examples of publications which contain spraying recommendations.

While all of your questions are not applicable to the above decision-making process, I am pleased to provide the following comments on a number of your questions.

1. Decision-Making Process

(a) What group or body within OMAF decides which pesticides to use for any crop spraying programs in Northern Ontario? (i.e. the 1979 Temiskaming armyworm spraying)

The recommendations are made by committees. For example, on the back of 296 is a listing of the organizations which had representation on or input to the 1979 Field Crop Recommendations.

Recommendations for armyworm control, which you mention specifically, can be found on Page 8 for corn, and Page 29 for cereal crops.

(b) On what do they base this decision?

1. What research is consulted?
2. Who is consulted?

cont'd...2

Attachment 5.)

1. What research is consulted? All research done at Federal and Provincial research stations and research and testing done by companies to prove this product is worthy of being on the recommended list.

2. Who is consulted? Members of the committees

(c) Does this same body decide which areas require crop spraying, and on what do they base this decision, i.e. who is consulted?

Decisions to spray are made by the farmers. Farmers, extension workers, crop specialists, pest management specialists and the Provincial entomologist are on the alert throughout the growing season, and when outbreaks of insects or diseases or weeds occur, information on them and the annually updated recommendations are communicated via radio, T.V., press and newsletters.

(d) How many are on this decision-making body?

1. Who are they? - Researchers, extension workers, farmers, industry representatives.

2. How are they put there? - By appointment.

3. Who appoints them? - They are selected from the various agencies and their appointments agreed to by respective agency heads and committee chairmen.

4. How long do they serve? - Appointments are made annually. Service on committees ranges from one year to several years.

5. How often do they meet? - At least annually.

(e) In general, what is the complete step by step process used by this body in deciding any crop spraying programs in Northern Ontario?

Answered above.

(f) To what extent are the various chemical companies involved in this decision-making process? Are they consulted?

Chemical companies have representation on various committees. In addition, they are consulted at times of outbreaks regarding availability of supplies.

Ontario Northland
Transportation Commission
195 Regina Street
North Bay, Ontario
P1B 8L3

Phone (705) 472-4500
Telex 067 76103

Ontario Northland

October 18, 1979

4640-1

Temiskaming Environmental Action
Committee
R.R. #2
Kenabeek, Ontario P0J 1M0

Attention: Mr. Henry Ingwersen

Dear Mr. Ingwersen:

This refers to your letter dated October 5, 1979. Your many detailed questions cannot possibly be answered; however, I hope that the following summary of our weed and brush spraying practices will be of some help to you.

Like any other railway in Canada, we inspect our right-of-way for vegetation growth and plan spraying programs on a cyclical basis. Our weed and brush removal is now largely done by chemical means rather than manual removal. This is for reasons of economy. When our weed and brush spraying program has been designated, tenders are received from the various contractors in the spraying business and the work is awarded based upon contractor's price, previous performance and availability of machinery. The chemicals we use and specify are used throughout the industry for this application and they meet all government environmental standards in force at the time. The contractors in this line of work are licensed by the Province of Ontario and their employees are also instructed on the proper application of the various chemicals.

Spraying is not carried out near waterways or near any other ponded water. In addition, spraying may be restricted in sensitive agricultural areas on windy days. Generally speaking, we have had very few complaints over the last five years from adjoining property owners. The results of the spraying programs are generally effective, however, they are also short-lived. We still do some brushing by hand throughout the railway system, especially around railway crossings and other built-up areas where visibility is more important.

..../2

Answers to Temiskaming Environmental Action Committee Questionnaire

Question

1 A. What group or body within Ontario Hydro decides which herbicides to use for the weed and brush control programs in Northern Ontario?

B. On what do they base this decision?
1) what research is consulted
2) who is consulted

Answer

1 A. & B.

Ontario Hydro's Department of Transmission Environment, Land Management Section, keeps abreast of various developments with herbicides and provides a list of suitable approved chemicals for the regions to use as well as the work procedures.

Research data on registered products is reviewed in co-operation with our Health & Safety Division, and with our Research Division. Liaison is maintained with Federal and Provincial agencies responsible for authorizing use. Literature reviews are done to keep abreast of Research and Development work. Attendance at seminars and symposiums upgrades our knowledge of the subject.

The Regional Transmission Lines and Environment Superintendent then decides which chemicals from this list will be used and discusses this with the Area Forestry Foremen.

Question

1 C. Does this same body decide which areas require chemical spraying, and on what do they base this decision? (B above)

Answer

1 C. The Area Forestry Foremen produce a spray program for the next year which is submitted to the Regional Supervisors for approval. Once the programs are approved at the Regional level, external licensing and controlling agencies are informed of our plans, (if required) and approval is sought. Once this approval is obtained, the program is started as soon as seasonal factors permit.

Many factors are used to determine what areas are to be sprayed but the most important one is to confirm that there is a need. Sections of rights-of-way that do not contain brush of sufficient size that might hamper the transmission and distribution of electrical energy are not sprayed.

If the need for control is established, then the project is scheduled with the local foreman deciding when and how the job will be done, working within the constraints of policies and work practices developed by both Head Office and the Regional Superintendent.

Question

1 D. How many are on this decision making body?
1) who are they
2) how are they put there
3) if appointed, who appoints them
4) how long do they serve
5) how often do they meet

Answer

1 D. The decision making body can vary from one person to many people depending on the complexity of the job.

Ontario Hydro has a wide spectrum of expertise available to any member of its field forces. When a question is raised, the person requiring the answer can refer it to the functional experts needed to answer the question, or assume the responsibility for providing a course of action.

None of these people are appointed. They have been given the responsibility for whatever expertise their jobs entail, and they meet when required.

Question

1 E. In general, what is the complete, step-by-step process implemented by this body in deciding each years' herbicide spraying program in Northern Ontario?

Attachment 7.)

Answer

1 E. Each Area Forestry Foreman is aware of the total number of high voltage and distribution lines for which he is responsible. He also knows when each line was last sprayed. When he produces his work program for the next year's work, he uses this date to select the lines that will probably require treatment. A field check is then made and the appropriate decision is made, which may be that no spraying is required. As well as this, patrols are made yearly of all lines for various reasons and reports may be received which indicate that a line which might be considered to be in good shape, isn't. The decision making process is not rigid and many factors are considered.

Question

1 F. To what extent are the various chemical companies involved in this decision making process?
1) are they consulted

Answer

1 F. The chemical companies have no input whatever in the decision making process. (We do review their data for the decision making data.)

Chapter 4 - Recommendations for Public Participation

It is clear in going over all of this gathered information - federal Registration, Provincial Legislation and regional and local use by various government agencies and other services, that there is a definite lack of public input into the use and control of pesticides that have an impact on that same public's environment.

Through consultation with other environmental groups and people in northern Ontario, TEAC has come up with some recommendations that would allow for public input at all three levels - federal, provincial and local, thereby ensuring increased public participation in matters concerning the environment.

Since the use of pesticides by groups or individuals is controlled by federal and provincial legislation, it would follow that the most important avenue for public input is at these legislative levels.

Federal Recommendations

Public input into the registration of pesticides is an important first step. A good model for public input at the federal level is the U.S. Environmental Protection Agency's "Rebuttable Presumption Against Registration (R.P.A.R.)" which has been in existence since March 1976 (see attachment 8.) "Rebuttable presumption against registration means that if a pesticide shows potentially dangerous characteristics, it is subjected to intensive scientific review and public comment before a decision is made on whether to allow continued use or begin the process of removing it from market."

Though the present review and re-evaluation process is thorough, it does not allow for public comment. Therefore we recommend:

1.) an amendment to the Pest Control Products Act similar to Rebuttable Presumption Against Registration that would allow for public input into the initial registration and re-evaluation of any pesticides, with an allowance of at least 90 days for submissions by the public.

2.) that such an amendment allowing for public input be under the auspices of a pesticides review board. However, we further recommend that:
a.) such a review board be represented by not only government departments with a direct interest in pesticides, but also by capable representatives of the public at large. These people could be non-

Attachment 8.)

FACT SHEET

REBUTTABLE PRESUMPTION AGAINST REGISTRATION
Open Decisions on Pesticide Safety

In 1972, Congress amended the Federal pesticides law to require stricter human health and environmental protection from pesticide abuse. EPA was charged with issuing rules for reviewing all pesticides to ensure they meet the new safety requirements. Some 35,000 pesticides consisting of 1,400 basic ingredients are now sold in the U.S. A key part of the EPA safety review is a process called "Rebuttable Presumption Against Registration" or "RPAR." It has been in effect for about a year and a half. (approx. March 1976)

Rebuttable presumption against registration means that if a pesticide shows potentially dangerous characteristics, it is subjected to intensive scientific review and public comment before a decision is made on whether to allow continued use or begin the process of removing it from the market.

The advantage of rebuttable presumption is that it allows EPA to gather extensive scientific information about the effects of a chemical before determining whether prolonged, courtroom-type hearings on safety are necessary. It ensures that benefits and risks are given full consideration.

RPAR is not the same as banning a pesticide. Whether this occurs will depend upon the type of information received by EPA and a judgment as to whether benefits appear to outweigh risks or vice versa.

The RPAR process may last up to 180 days. During this time, the pesticide in question may continue to be sold. At the end of this period, EPA will announce that the pesticide appears safe for continued use or that it may cause unreasonable adverse effects on the environment. If the latter occurs, additional investigation into benefits and risks begins. This includes consultation with scientific and economic experts and the opportunity for further comment from the general public.

Pesticides that have had RPAR notices issued on them thus far are: BAAM (Amitraz), BHC, Chlorobenzilate, Chloroform, Diallate, Endrin, Lindane, Pronamide, Strychnine, Strychnine Sulfate, 1080, 1081, Toxaphene, Kepone, the EBDC fungicides and Dimethoate.

August 1977

Attachment 8.)

THE REBUTTABLE PRESUMPTION PROCESS

The hazardous criteria that trigger rebuttable presumption are: (1) if the pesticide is highly toxic and may pose the threat of immediate poisoning to people or wildlife; (2) if it may cause serious long-term health problems such as tumor formation or mutations in people or "non-target" animals, or (3) if the pesticide lacks an emergency first-aid treatment.

If a pesticide ingredient meets one or more of the risk criteria mentioned above, the rebuttable presumption process comes into play as follows:

1. Manufacturers and users of the suspect pesticide, and the general public, are notified of the risk information and given 45 days to offer rebuttal evidence. This period for submitting views may be extended by 60 days.

2. At the end of this period, EPA announces whether or not all risks have been rebutted.

3. If they have, EPA proposes to allow continued use of the pesticide. If they have not, an internal analysis of risks versus benefits is undertaken. Up to 180 days may have elasped by this time, and the pesticide in question may continue to be sold.

4. Depending upon the outcome of the risk/benefit analysis, the pesticide is proposed for approval, or EPA begins formal consultation with the U.S. Department of Agriculture on the economic impact and sales. An independent Scientific Advisory Panel reviews health and environmental effects information.

5. Roughly 60 days after the USDA and scientific consultation, EPA must again decide whether to propose continued use of the pesticide or issue a "notice of intent to cancel" further production and sale. Regardless of which way the decision goes, the opportunity for a public hearing exists.

A "notice of intent to cancel" represents EPA's finding that a pesticide generally causes unreasonable adverse effects upon the environment. It provides manufacturers and users of the pesticide and other interested persons the chance to request courtroom-type hearings on risks and benefits. Depending upon the complexity of the issues, these hearings may

last a year or longer. The eventual outcome is a decision by the EPA Administrator on the pesticide's future. During cancellation hearings, the pesticide may continue to be sold.

"Suspension" may interrupt either the rebuttable presumption or cancellation process at any point. It is based upon a finding of imminent hazard posed by the pesticide. A brief public hearing may be held. (The exact length of this hearing may be determined by the EPA Administrator.) The purpose of a suspension is to decide whether to allow continued sale of a pesticide during the time it would take to hold more in-depth cancellation hearings.

Cancelled pesticides include most uses of DDT and aldrin and dieldrin, some mercury pesticides and certain predator poisons used primarily for coyote control. Chlordane and heptachlor have been suspended.

EPA's pesticide registration rules, including the rebuttable presumption process, appeared in the July 3, 1975 Federal Register. See Section §162.11 of Vol. 40, No. 129.

government and non-industry scientists and doctors, farmers, representatives of native, environmental and public interest groups, members of the academic community, etc.

3.) that such an amendment, administered by this balanced interdepartmental and peer review board be applied during the initial registration as well as the subsequent re-evaluation of any pesticide, and
a.) that this amendment and peer review process include not only the pesticide but any solvents, emulsifiers, surfactants, dyes or any other inert or any active ingredients used with the pesticide.

We feel this would allow for a more balanced pesticide registration and re-evaluation process.

Provincial Recommendations

The first recommendations deal with the Environmental Assessment Act, as it appears to be the initial point of the decision-making process with respect to provincial environmental legislation.

1. All pesticide programs of all of the various agencies such as Ontario Hydro, Ministry of Transportation and Communications, Bell Canada, CN, CP, Ontario Northland, Trans Canada Piplines etc. be placed under the auspices of the Environmental Assessment Act.

2. That all agricultural spray programs be placed under the Environmental Assessment Act.

3. The Ministry of Environment should provide legal advance notice of environmental impact programs whereby the public has at least ninety days to assess the information and prepare a submission.

4. That no information or hearing or part of a hearing regarding the environmental impact of a project be kept secret or closed to the public.

5. The power of the Minister and the Cabinet to reject or alter the decision of the Environmental Assessment Board, should be limited. They should retain the power to request another hearing.

Recommendations one and two would allow the public to be involved in the decision-making process at the initial planning stage of a project concerning pesticides, as these programs account for the largest portion of pesticide use. As was mentioned earlier in this report only the spray programs of the Ministry of Natural Resources will be coming under this act.

Recommendations three and four would greatly facilitate public participation and allow interested persons adequate time to make a well prepared submission.

Recommendation five would insure that the system of checks and balances set up by this review procedure could not be overruled by political expediency.

The following recommendations deal with the Pesticides Act, as it has potential for public participation via the Pesticides Advisory Committee.

6. That all sprayed areas, operational and experimental be posted with officially authorized signs showing date and chemical used.

7. That a formal channel be created similar to the Environmental Assessment Act whereby the public could make a submission to the Pesticides Advisory Committee concerning a specific pesticide or The Pesticides Act. A section in addition to the Pesticides Act could effectively institute a public review period of not less than 90 days when an annual application is made to use a pesticide in the restricted class.[7]

8. That all of the agricultural sector be brought under the licence and permit requirements of the Pesticides Act.

Recommendation six should be part of the general prohibitory section of the Pesticides Act as a matter of safe practice. It relates to public participation in the decision-making process from the point of view of enabling the people who live in or near these sprayed areas to see first hand how much or how little of their area is involved in a spray program and hence allow people to decide whether public participation is warranted in their area.

Recommendation seven is self explanatory. A letter from the Deputy Minister regarding public participation and the Pesticides Advisory Committee is quoted earlier in this report stating "there is no formal channel ..... but in theory there is no reason why the Pesticide Advisory Committee would refuse such a request..." This recommendation would insure possible public participation.

Recommendation eight would mean that a large group of pesticide users would come under the Pesticides Act. The advantage of this would be in the regulatory aspect of the act from the point of view of record keeping and mandatory applicator education. With respect to public participation in the decision-making process this would mean that there would be more consistent detailed records available which would provide valuable information for preparing submissions and assessing environmental impact.

Local Recommendations - Public Awareness

1. Join a concerned citizens group or an environmental group. Why?
   a.) your concerns are not isolated but can be focused as a group of individuals. This will increase public awareness.
   b.) it is easier to collect information and co-ordinate it in one place.
   c.) as a group, it is easier to organize public information meetings at which you can express your concerns, stimulate discussion, etc.
   d.) it is easier to organize demonstrations and other public displays of solidarity. This type of action is effective in bringing about public attention to your concerns. Don't shun it merely because you think it labels you as "radical".
   e.) it is comforting for some people to know that they are not "alarmists" and that people from all walks of life share their concern for human health and the environment.

2. If your next door neighbour (farmer, gardener) is using a pesticide that you feel is bad for human health or the environment, tell him so. In most cases he has a legal right to use the chemical, but expressing your concerns to him (or her) in an open and honest manner will at least let him see another view point. Who knows? They may think twice about using the pesticide next time.
   If your neighbour is using a pesticide in conditions that are causing the chemical to drift onto your property, tell him so. This is something he is not legally allowed to do.

3. Tell the government agencies or utilities that are carrying out spraying programs in your area how you feel about the pesticides they are using in particular and express your concern on the use of any pesticides at all. Letters and phone calls expressing your concern are both effective and educational. They show another viewpoint.
   Also, inform any agencies spraying rights of-ways (hydro, telephone) that you don't want any spraying done on rights-of-way bordering your land. Notify in advance, when possible, and in most cases where there are co-operative agencies, the sprayers will be shut off on your land borders. Posting "No Spraying" signs on the borders of your land is a good idea.

4. Write letters to your local MPP and MP expressing your concerns on the use of pesticides. Letters and phone calls to the various provincial and federal ministers responsible for pesticide legislation and individual spraying programs are also a good way to show your concern.

Enforcement of The Pesticides Act - A Form of Public Participation

As the section heading suggests, enforcement of the Pesticides Act can be a form of public participation in the decision-making process from the point of view that a working knowledge of The Pesticides Act would enable members of the public to spot violations of this Act. This has an effect on the decision-making process in that a history of repeated violations by an applicant, would in some cases determine if further licensing is granted.

The following is a list of steps to take if you witness or suspect a violation of The Pesticides Act.

1. We strongly urge interested people to acquire a working knowledge of environmental legislation particularly The Pesticides Act, 1973.

2. If you are unsure whether a particular incident contravenes The Pesticides Act inquire at the regional or district offices of the Ministry of the Environment. If you feel further inquiry is merited regarding interpretation of the Act, contact the Legal Services Branch of the Ministry of the Environment in Toronto. When you inquire be specific about the suspected incident so that accurate advice may be given.

3. If you are reasonably certain an incident is in violation of The Pesticides Act ask the offender to stop, mentioning your reasons for doing so.

4. At this point it may be prudent to make accurate documentation of the incident, if possible, a witness may be useful; eventually prosecution in the form of a civil action may be taken in which case such evidence would be very useful.

5. With respect to documentation of the incident, in your own handwriting, a report should be written giving the date, time, location, wind and weather conditions, name of people or agency involved, the nature of the violation and your actions.

6. A call should be made to the district or regional office of the Ministry of the Environment as soon as possible, reporting the incident. This is important as time is a factor in determining existence of pesticide residues.

7. If you feel the response of the district office was unsatisfactory, contact the provincial office in Toronto. If you are still not satisfied you should contact the Minister of the Environment; you may also want to seek the advice of a lawyer as you do have a right to bring

private prosecution to enforce the laws of Ontario. It is because of this possibility that as much evidence as possible is desirable . To inquire about legal services with respect to environmental concerns we suggest you contact the Canadian Environmental Law Association, Toronto.

Anecdotes of Personal Experiences with Pesticide Programs

Settling it on your own - The story of Mr. X

Another direct way of dealing with situations that involve the mis-use of pesticides is to take the situation firmly in hand by yourself.

A man in this area did just that this summer. It was a very windy day and the local electrical utility was spraying the herbicide Tordon 101 on a right-of-way directly opposite Mr. X's land. His house and open hay shed were close to the road, and the strong wind blew the spray across the road and on to Mr. X's property. Mr. X claimed that his hay was contaminated and unfit to feed his animals the following winter. This is what he did:

1. he immediately asked the spray crew to stop spraying across from his property, which they did, (they moved down the road and continued).
2. Next, Mr. X called the nearest Ministry of the Environment office. They responded by coming to his property and taking hay and soil sample for testing.
3. Mr. X then went to the regional office of the electrical utility and told them exactly what happened, and demanded compensation for his contaminated hay.
4. After one or two meetings with utility officials and a six month wait, Mr. X was awarded a cash settlement from the utility.

Observation of the Decision-Making - An Experience Shared

Through this Royal Commission on the Northern Environment project, TEAC had the opportunity to observe the decision-making process carried out by the Ontario Ministry of Natural Resources in their 1980 spruce budworm spraying program in Northeastern Ontario.

To date we have observed three meetings of the 1980 Spruce Budworm Committee. This committee includes unit and district foresters, provincial pest control officers and Canadian Forestry Service representatives who meet during the winter to plan the Northeastern Ontario Spruce Budworm control program.

From the beginning of the meetings it was apparent that the decision on the method of control had been made - aerial spraying of chemicals. The decisions being made at these meetings were what chemicals, how much and where for both experimental and commercial operations, as well as planning the logistics of the spray program. Therefore, our position at the meetings was not to help decide on a control method, (which had already been decided on and was one we couldn't endorse), but simply to state our position on the spraying program and, through the Royal Commission on the Northern Environment project, observe the workings of the committee.

At the first budworm committee meeting we submitted a brief outlining our position opposing the use of Matacil (aminocarb) in particular and aerial spraying in general. The brief also contained possible alternatives to the budworm spraying program. Because aerial spraying was the chosen method of control, all we could do at this point was to insist that less spraying be done this year and that as much consideration as possible be given to improved silvicultural methods and biological alternatives such as B.T. (bacillus thurengiensis), which seems to be safer than nerve poisons such as Matacil.

At this time the Ministry of Natural Resources issued a new policy entitled "Selection Criteria for Protection Spraying Against Spruce Budworm", which sets constraints on spray programs, such as requiring that construction of access roads must be initiated within one year and completed within three years of the start of spraying and that spraying may be conducted on commercially operable forests for a maximum of three years.

After three of these meetings it is evident that our impact as a concerned citizens group had clearly reached its limit. Our position remained unchanged, and we had repeatedly expressed our concern for long-term environmental quality over short-term economic quantity.

We are grateful to the Ministry of Natural Resources for the chance to observe the budworm committee and state our position concerning aerial spraying.

Part II: Pesticide Use In Northern Ontario

In order to gather data on the pesticides most widely used in northern Ontario, we sent a questionnaire to the six organizations that carried out any kind of pesticide programs in 1979 (see part 2, "General Pesticide Information" of attachment 1 at the end of Pt.I of this report).

The answers we received are enclosed as attachments - listed as follows:

Attachment 9.) Ministry of Natural Resources
" 10.) Ministry of Transportation & Communications
" 11.) Northern Telephone
" 12.) Ministry of Agriculture & Food
" 13.) Ontario Hydro

Ontario Northland sent no data on pesticide use (see Attachment 6 in Pt. I of this report). The total agricultural use of pesticides (herbicides and insecticides) in Temiskaming is quite significant, however, we had neither the time nor the manpower to gather data on the pesticide use of individual farmers.

Chapter 1 - Specific Pesticide Information

It is evident from the chart that the most widely (table 1) used pesticides in Temiskaming in 1979 were the carbamate insecticides Matacil and Sevin and the phenoxy herbicide 2,4 D. We have included a small amount of information on each of these three pesticides condensed from the massive amount of research available, and particular attention was given to environmental and human health effects. For more information consult the bibliography in the back of this booklet.

The Carbamates - Formulation of Matacil 1.8D in percentage by weight is aminocarb 19.4%, diluent 585 (oil) 29.4% and nonyl phenol (a solvent) 50.2%.

Sevin is registered federally as a commercial pesticide, and can be used in Ontario on crops, orchards, and forest soil insects. Matacil, however, is in a "restricted" category and is registered in Canada for forestry use only. This is mainly due to its extreme toxicity to humans.

Matacil (aminocarb) and Sevin (carbaryl) are both carbamate insecticides. The way carbamates work is that they inhibit acetylcholinesterase, an enzyme that controls nerve impulses in the bodies of most animals, man included. When acetylcholinesterase is inactivated by a lethal dose of Matacil or Sevin, nerve impulses are out of control, and spasms, paralysis and eventual death occur in the target organism.

Table 1 1979 Pesticide Use (Temiskaming District)

Most Widely Used Pesticides	User	Use	Acreage or Amount	Cost	Method
Aminocarb (Matacil)	MNR	to control Spruce Budworm	approximately 26,000 acres (sprayed twice)	$115,000 (aircraft and materials, double appl.)	Aerial Spraying
Carbaryl (Sevin)	Temiskaming Farmer(coordinated by OMAF)	to control army worm	9,000 acres in Temiskaming.	$10.00/acre $90,000	Aerial Spraying
Bacillus Thuringiensis, B.T. (Thuricide)	MNR	to control Spruce Budworm	approximately 4,000 acres	$24,400(aircraft & mat.)	Aerial Spraying
2,4-D	MNR	conifer release program	1,000 - 2,000 acreas in Kirkland Lake area	$10.00/acre $10 - 20,000	Aerial Spraying
2,4-D + Picloram (Tordon 101)	Hydro	weed & brush control on rural dist. lines	1500 kilometres in northeastern Ontario	$400,000	Ground Spraying
2,4-D + Picloram (Tordon 101)	Hydro	weed & brush control on high voltage rights of way	2,000 hectares in northeastern Ontario	$600,000	Ground Spraying
Tordon 101, Sodium T.C.A. 2,4-D	MTC	weed & brush control on rights of way	7,000 acres in northern Ontario (from Huntsville north)	$290,000	Ground Spraying

Toxicity - The accepted method of recording the relative toxicity of a pesticide is Lethal Dose 50% (LD 50). This is a statistical estimate of a chemical dose which, when administered, will kill 50% of the test animals under stated conditions. The figures which designate the LD 50 values are expressed in milligrams of dose per kilogram of body weight of the test animal (mg./kg.). The acute oral LD 50 means a single oral dose given. Dermal LD 50 denotes absorption through the skin. The higher the value given for LD 50 the less toxic the material.

The LD 50 values are one of the criteria used by the federal government to classify pesticides into the Domestic, Commercial or Restricted categories.

Toxicity of Carbamates to Mammals [8.]

	Acute Oral LD 50	Dermal LD 50	Lethal Human Dose
Sevin	400-900 mg/kg	>4000 mg/kg	1 tsp-1 ounce
Matacil	21 mg/kg	no data	1 taste-1 tsp.
Strychnine (for comparison)	20 mg/kg		1 taste-1 tsp.

Persistence and Breakdown Products

Both Sevin and Matacil break down in plants, soil, and water. Matacil, in the acidic water and foliage of northern forests, takes up to 30 days to completely break down in the soil.[9.] However, Matacil breaks down photolytically (in sunlight) and metabolically (in plants and soil matter) into many derivatives, some of which are still carbamates and up to five times as toxic as the parent chemical.[10.]

At the present time, persistence studies of Matacil (aminocarb) do not include the study of these breakdown products.

Long-Term Research

Matacil has been registered for use on the basis of short-term toxicological studies and environmental effects. There seems to have been very little research done on chronic, long-term effects of Matacil concerning:
- neurological damage
- cancer
- birth defects
- chromosome damage
- viral enhancement

We have requested these types of long-term studies on Matacil from both the manufacturer of Matacil in Canada, Chemagro, and Agriculture Canada. To date we have not received them. Unfortunately, stringent testing in this respect is not required for initial registration of a pesticide.

The carbamate Sevin, however, has undergone some long-term testing. In a study by Proctor and Casida, it was shown that methyl carbamate concentrations as low as .6 to 2.0 ppm caused a severity of teratogenic (birth defects) signs in chicken embryos.[11] Carbaryl is also teratogenic in high doses to guinea pigs,[12] and in low doses to dogs[13] and mice.[14]

Viral Enhancement and Reyes Syndrome

Reyes Syndrome is just one of the rare diseases that is thought to be due to the interaction of viruses (such as influenza B) and certain environmental toxins. Research by Drs. Crocker and Rozee at Dalhousie have indicated the solvents and emulsifiers in insecticide sprays cause enhancement of viruses in young mice. The result was a high death rate among the mice, preceded by symptoms identical to those of Reyes Syndrome in humans. Fourteen children have so far died of Reyes Syndrome in heavily sprayed New Brunswick, and the usually rare disease has also occurred in high numbers in Quebec, another province with an extensive aerial spraying program. Both Matacil and particularly nonyl phenol, an inert solvent that makes up 50% of the Matacil formula, have been tested at Dalhousie and shown to cause enhancement of viruses.[15]

Carbamates and Non-Target Organisms

Like all carbamate insecticides both Matacil and Sevin are extremely toxic to all hymenoptera (bees, wasps, etc.). Matacil and Sevin are so toxic to honeybees that 1.16 micrograms (less than one-millionth of an ounce) kills 50% of all honey bee workers, and 3 micrograms kills virtually all of them.[16] When carbaryl (Sevin) was fed to bees in sub-lethal doses it was found that the bees incorporated the carbamate into the honey. It was still detectable in the honey 64 days later.[17] In OMAF publication #296 it states that "when planning to apply a pesticide advise nearby beekeepers so they have an opportunity to move colonies out of the danger area".[18]

Another unfortunate fact is that the spraying of Matacil kills many wasps and spiders that are natural predators of the spruce budworm.

Matacil spraying in New Brunswick in 1977 and 1978 killed 70% of spiders and 50% of ichneumonid wasps, both of which are budworm egg predators.[19]

Fish

A study done by Zitko and McLeese and Sergeant of Fisheries and Oceans Canada proved the solvent nonyl phenol (50% of the Matacil formula) to be very toxic to young salmon. Since trout are of the salmon family, this could have serious implications on fish adjacent to these sprayed areas. And even though Matacil is not sprayed within 1200 feet of bodies of water, the fact of aerial drift along with the lack of study on the persistence of nonyl phenol in the environment make toxicity to fish in the area a very real concern. The study concludes that "since nonyl phenol is supposedly an inert ingredient, its presence is an unnecessarily increased hazard to the freshwater and marine environments. A substitute for nonyl phenol should be found."[20]

2,4-D - What is it?

The herbicide 2,4-D is one of the chlorinated phenoxy compounds developed at the U.S. Centre for Chemical and Biological Warfare at Fort Dietrich, Maryland, during World War II. The three most commonly used members of this herbicide group are 2,4-D, 2,4,5-T, and 2,4,5-TP. However, 2,4,5-T and 2,4,5-TP (Fenoprop) were temporarily banned in Ontario in 1979 due to studies conducted in Oregon which connected aerial spraying of those substances to miscarriages of several women.

2,4-D (and all phenoxies), imitate auxin, a plant hormone, when applied to broadleaf plants. Normal growth ceases within hours. Young leaves stop expanding, the roots are no longer able to absorb water, and photosynthesis is inhibited. Phenoxy herbicides disrupt the normal function of the plant cell nucleus and promote uncontrolled expansion and division of cells.

Toxicity

	oral LD 50	dermal LD50	lethal human dose
2,4-D	300-700 mg/kg	800-1500 mg/kg	1 tsp.

The LD50 of 2,4-D is quite high. For this reason it is used quite extensively on food crops, and until recently was thought to be relatively harmless to humans. In the last few years, much conclusive, long-term research has come to light showing that 2,4-D is not quite the safe pesticide it was thought to be.

Is 2,4-D a Carcinogen?

In a review that includes every U.S. study done on the carcinogenicity of 2,4-D in mammals, Dr. Melvin Reuber of the National Cancer Institute concludes that "2,4-D is carcinogenic in male and female rats and probably also in mice." He goes on to say that "Virtually every chemical which has been found to be carcinogenic in humans is also known to be carcinogenic in one or more other mammalian test animals. We strongly feel that a finding of carcinogenicity in one mammalian species is therefore relevent to all mammals, including humans, even though direct evidence of danger to humans may not be available."[21]

From these and other studies, the U.S. Environmental Protection Agency's Cancer Assessment Group found "positive evidence that 2,4-D is carcinogenic."[22]

2,4-D and Birth Defects

The potential of 2,4-D to cause birth defects first came to light in 1969. At that time the Mrak report was released, a 7-year study commissioned by the United States Department of Health, Education and Welfare. The study included the test results of the Bionetics Laboratories research into the effects of 2,4-D on mice and the tests clearly indicated that 2,4-D was teratogenic (caused birth defects) in the lab animals. Out of this research the Commissions' Panel on Teratogenicity recommended that the butyl, isopropyl and isooctyl esters of 2,4-D be "immediately restricted to prevent risk of human exposure."[23]

Soon after, the U.S. Food and Drug Administration, the U.S National Institute of Environmental Health Science,[24] the Canadian Food and Drug Directorate[25] and Dow Chemical Company[26] produced test results on 2,4-D. All of these published findings showed that 2,4-D, its various formulations, and one breakdown product produced teratogenic effects in mice and hamsters.

Critics have sometimes said that such teratogenic research on mice and rats has no relationship to human beings. Of this, Dr. Theodor Sterling of Simon Fraser University states "the mouse is one species that heralds teratogenic effects in man."[27] This was certainly true in the case of the powerful teratogen Thalidamide, of which Dr. Samuel Epstein reminds us, "humans are 60 times more sensitive to Thalidamide than mice, 100 times more sensitive than rats, 200 times more sensitive than dogs and 700 times more sensitive than hamsters."[28]

For years, 2,4-D has not received the detailed scrutiny

it deserves. This is partially due to the fact that it has been overshadowed by public concern over 2,4,5-T, which contains the dangerous contaminant TCDD or dioxin (2,4-D does not contain TCDD). Also, due to the fact that 2,4,5-T has been temporarily banned in Ontario, there are powerful economic pressures to keep restrictions from being placed on 2,4-D, which so many agencies and individuals now solely rely on for weed and brush control.

2,4-D and other phenoxy herbicides are currently undergoing re-evaluation by Agriculture Canada.

Chapter 2 - Pesticide Drift

The drift of aerially applied pesticides is a fact recognized by scientists and concerned citizens alike. We have been assured by MNR that off target drift is hardly ever more than 10%. However, in NRCC report #16073, Proceedings of a symposium on Fenitrothion, Dr. Armstrong states that in normal spraying operations approximately 50% of the spray is deposited on the target, depending on the dispersal system used and the degree of atomization. Of that data that Dr. Armstrong has compiled in this same report, he says "the data indicate that under most conditions a deposit of 50% of the emitted spray is a good spray."[49] The attached table from studies on the aerial application of acephate (Armstrong and Nigam 1975) shows the variations in percentage of spray deposited that can be found in a well controlled experimental aerial spray (Table 2). An average of the percentage of spray deposited in all of these spray blocks is 35%.

The data in Table 3 is again the records of deposits across spray blocks. The variations there are from 3.1 - 237%.

The great variations found in both of these tables indicate an alarming lack of precision due to meteorological conditions.

One may well wonder what happens to the other 50% of the spray. In this same report, Dr. Armstrong states that "at the extreme limit are the small droplets (5 - 10μ) which will remain airborn for hours." And in speaking to a 1973 Pesticides Accountancy Workshop, Dr. Armstrong said that in setting out spray cards and observing the droplets coming down, he found spray droplets coming down more than 30 minutes after the passage of spray aircraft flying at 150 ft. and that the mass median diameter of these droplets was 70 - 80 microns. He also said that in this case only 50 - 60% of the spray reached the ground. At this same meeting Dr. J.J. Fettes said that research he had done showed that what was deposited on spray cards on the ground was

Table 2. Variations in spray deposits on spray blocks (from Armstrong and Nigam 1975).

Plot	Total emitted (kg/ha)	Actual deposit (kg/ha)	Percentage spray deposited	Position of sample card
A	0.21	0.15	70.9	good
B	0.42	0.11	25.9	"
D	0.63	0.26	41.0	"
E	0.21	0.21	100	"
F	0.42	0.23	53.6	"
G	0.63	0.41	66.2	"
H	0.21	0.03	13.3	restricted clearing
J	0.42	0.05	11.4	"
K	0.63	0.19	30.6	good
42	0.63	0.03	5.3	restricted clearing
126	0.63	0.02	5.0	"
101	0.42	0.01	4.2	"

Average - 35.6%

Table 3. Variation in spray deposits across experimental spray blocks[a].

Emission rate - 4.67 l/ha	Deposit	
Position	l/ha	Percent volume deposited
1	1.38	29.5
2	0.89	19.0
3	1.78	38.0
4	0.98	21.0
5	0.27	5.8
6	0.24	5.1
7	0.46	9.5
8	0.14	3.1
9	0.21	4.3
10	0.65	14.0
Emission rate - 9.35 l/ha		
1	11.01	118.0
2	5.54	59.4
3	4.46	47.8
4	6.51	69.9
5	10.82	116.0
6	3.26	34.9
7	2.05	21.8
8	16.11	172.0
9	3.93	42.0
10	4.79	51.1
11	4.79	51.1
12	22.19	237.0

[a] Raw data from spray trials at Petawawa Forest Experiment Station.

approximately what was found on spray cards on the tops of trees. And therefore, he said "if 60% of the emitted material fell to the ground that is about all that fell in the forest."[30.]

So this great percentage which does not land in the trees or on the ground can, in the case of Elliot township Matacil spraying, travel to the campsites at Esker Provincial Park in ½ hour in a light breeze of 8 mph; and in a 10 - 12 mph breeze those particles still suspended in the air after an hour could land in the populated settlements near Kirkland Lake.

Coupled with the lack of research into the chronic low-dose exposure to pesticides such as Matacil, the risk of human exposure to the drift of aerial or ground applied pesticides is one of the most disturbing facts of pesticide use. Tests at Dalhouse University indicating a lethal interaction of nonyl phenol (a solvent in Matacil) and Matacil with common viruses are sufficient reason to rule out the aerial application of Matacil as an intelligent solution. Priority should be given to improved forest management methods and if spraying is absolutely necessary, alternatives such as B.T. (thuricide) be used. Studies have been conducted and it does not show any viral enhancing activity.[31.]

Chapter 3 - Synergism

Synergetic, synergic is defined in the dictionary as "working together", with respect to chemicals in the environment, this is exactly what happens - they work together. This working together of chemicals often results in new chemicals being formed or one chemical potentiating the effects of another. The term potentiation refers to the phenomena observed when a compound, although having no direct toxic effect per se at the dosage employed, is able to substantially enhance the observed toxicity of another substance with which it is combined.[34.]

The following are excerpts from studies and articles we collected in our literature search on the subject. A complete reference to these articles may be found at the end of this booklet.

"This discovery (interaction of Malathion with other organic phosphate pesticides) led to the testing of other combinations. It is now known that many pairs of organic phosphate insecticides (ie. malathion, parathion) are highly dangerous, the toxicity being stepped up or potentiated through combined action. Potentiation seems to take place when one compound destroys the liver enzyme responsible for detoxifying the other. The two need not be given simultaneously.

The hazard exists not only for the man who may spray this week with one insecticide and next week another; it exists also for the consumer of sprayed products. The common salad bowl may easily present a combination of organic phosphate insecticides. Residues well within the legally permissable limits may interact."[33] Rachel Carson also discusses findings that indicate that one of the plasticizing agents may interact even more strongly than another insecticide to make malathion more dangerous. In 1962 Rachel Carson writes "A bare beginning has been made on this subject, but already it is known that some organic phosphates (parathion and malathion) increase the toxicity of some drugs used as muscle relaxants and that several others (again including malathion) markedly increase the sleeping time of barbituates."[34]

Since that time more work has been done on the subject of synergism. One of the combinations being studied is insecticide interactions with viruses. The following is from an article published in 1974. "Cases of non-specific encephalopathy and fatty visceral changes (Reye's syndrome) in children living in the vicinity of forest spraying operations stimulated this work in mice. Two day old mice were given topically, for 11 days, dicophane (D.D.T), fenitrothion (an organophosphate), fenitrothion pluss D.D.T., or corn oil (control). After a further 2 days a sublethal dose of encephalomyocarditis virus was injected subcutaneously in known titre. Mortality-rates in the 10 day period after virus injection were 6 - 17% in D.D.T groups, 4 - 9% in fenitrothion groups, 33 - 60% when both insecticides were used, and 0% in corn-oil controls. Fatty changes were noted in liver and kidney in the insecticide/virus groups. The encephalopathy showed no specific central-nervous system lesion, but death followed a sequence of paralysis and convulsions. The possible role of exposure to combinations of insecticides in human viral susceptibility requires further attention."[35]

This article also from 1974 discussed the synergism of a food additive (nitrites) and a pesticide (carbaryl). "We have found that the combination of a food additive, sodium nitrite, with a commonly used pesticide, carbaryl, results in the formation in acid solution of a new mutagen of considerable potency, nitrosocarbaryl. A study of the reactions leading to formation of mutagens and carcinogens from several types of pesticides and herbicides is reported elsewhere." A description of the experiment follows and they conclude "Nitrosocarbaryl is also a possible hazard to man, since its precursors carbaryl and nitrite are both common environmental constituents which are consumed (carbaryl as a crop residue and nitrite as a food additive), and the stomach provides the acidic conditions for its formation. This interaction is likely to be biologically significant because N-nitroso compounds are known to act systemically and to be most effective

as carcinogens when administered in small doses over long periods of time. No animal species have yet been found to be resistant to the biological effects of n-nitroso compounds, and on the basis of the known carcinogenicity and mutagenicity of its close structural analogue NMUr, nitrosocarbaryl is likely to be a carcinogen as well as a mutagen."[36]

As well as the potential hazard to human health resulting from the synergism of environmental contaminants; research is being done on its effects on other species. The following is a summary of an article published in 1975.

"Coexposure of rainbow trout to a nonlethal concentration of carbaryl (Sevin) significantly increased the acute toxicity of 2,4-D n-butyl ester, dieldrin, rotenone and pentachlorophenol. Arecoline, a direct acting cholinergic agent, was also capable of enhancing the toxicity of the compounds tested."[37]

More recent research (1977) indicates that attention must be paid to the solvents and emulsifiers as well as the active ingredients in pesticides with respect to their synergistic potential. "Widespread exposure of humans to various chemicals and emulsifiers is a fact of modern life. The possible result of such exposure has been the subject of much speculation. Other investigators have noted the effect of certain chemicals on virus infectivity, and it is becoming increasingly suspect that in some diseases of multiple etiology an environmental factor apart from virus infection must play a part. In light of recent investigations, one groups of chemicals in our environment that warrants further investigation should be the ubiquitous emulsifiers."[38]

The possibilities of synergism are a definite concern to people in northerly climates as the acidic soils and cold water are ideal conditions for the persistence of these chemicals.[39] As pointed out earlier in this report several different chemical sprays (including those mentioned in the studies quoted above) are used in spray programs in this area as well as those used on private land and gardens. Our search of the information on synergism leads us to feel that more research on this subject is definitely required and that this information must be taken into account in the decision-making process.

Chapter 4 - Recommendations

Concerning Matacil

1. An immediate ban should be placed on Matacil in Ontario until research being carried out at Dalhousie University proves conclusively that Matacil and its solvents, diluents or dyes is not related to Reyes Syndrome or any other disease resulting from the interaction of viruses and environmental toxins.

2. Matacil (aminocarb) should not even be registered for use in Canada until sufficient independently performed publicly published tests are done. These would include:
   - long term, (2 year) animal studies for any effects such as teratogenicity, carcinogenicty, mutagenicity and especially nervous disorders.
   - Ames test for mutagenicity in bacteria, and then repeated in liver cell culture.
   - synergistic effects with other pesticides, especially the widely used herbicide 2,4-D.

3. Matacil should not be registered until all of its breakdown products have been studied as intensively as ought to be required of the parent compound. This would include half-life studies of each breakdown product, as well as short and long-term studies.

Concerning 2,4-D

1. TEAC recommends that an immediate ban be placed on the non-agricultural use of 2,4-D accompanied with an enforced "scaling down" of 2,4-D use in agriculture, culminating in a total ban on 2,4-D. As is evident from this report, there is ample evidence showing "the demonstrable carcinogenic and teratogenic effects of 2,4-D."[40]

2. Until this ban takes place, we would recommend that the agencies and individuals who use 2,4-D examine and give serious consideration to alternatives to chemical weed and brush control. This would involve:
   - seeing that there is a real need to spray (ie. is the brush really threatening rights-of-way, or is spraying being done only out of habit or for cosmetic reasons).
   - if there is a need for weed and brush control, priority should then be placed on alternatives to chemical control such as hand trimming and mowing, or the planting of species of small trees and shrubs that inhibit the growth of unwanted weeds. These alternatives are more labour intensive than chemical control.

- another way to cut down on pesticide use would be for two agencies (ie.MTC and Hydro) to "double up" on the spraying of rights-of-ways where possible.

3. We recommend that more testing be done on the persistence of 2,4-D in plant, soil and water of the colder northern climates such as northern Ontario.

4. Signs should be posted to warn would-be berry pickers what, when and where spraying has taken place. Many edible berries such as raspberries and strawberries grow in abundance along rights-of-way and similarly blueberries on crown land.

Concerning All Pesticides

1. Long-term testing, including independant, publicly published studies on:
   - carcinogenicity (cancer)
   - teratogenicity (birth defects)
   - mutagenicity (genetic mutation)
   - viral enhancement
   - synergistic potential

   should be a mandatory part of the initial registration process of any pesticide.

2. All inert or active ingredients, including emulsifiers, solvents, diluents or dyes should be listed on the pesticide label and should also be required to individually undergo a stringent registration process similar to the active pesticide.

3. All research used to register and re-evaluate a pesticide should be made available to the public. After all, if a product can't withstand public scrutiny, it shouldn't be registered.

4. Before a pesticide is used in an area, there should be independant, publicly-published studies done on the synergistic effects of that pesticide with any other environmental contaminent being used in the area.

Ministry of Natural Resources Attachment 9.)

2. Herbicide and Insecticide Information

A. Herbicides

The only herbicide which the Ministry is planning to apply operationally by air in 1980 in Northern Ontario is 2,4-D. A limited amount of simazine may be applied from the ground either broadcast or spot application to control grass, principally on old farmland which is being planted to trees. Silvisar 550 will be used for stand improvement by injecting it into individual cull trees.

Insecticides

Any insecticide registered with Agriculture Canada under the Pest Control Products Act for control of spruce budworm may be considered for use in Northern Ontario. A listing of these materials, and the regulations and restrictions governing their use, are contained in Trade Memoranda issued periodically by the Plant Products and Quarantine Division, Agriculture Canada. They are also summarized in "A Compendium on Pesticides Registered for Use in Canada Against Pests of Forests, Trees and Shrubs", Report CC-X-19, Chemical Control Research Institute, Environment Canada, 1976. (Forest Pest Management Institute Library, Sault Ste. Marie).

MNR's selection of a material is dependent upon its efficacy against the budworm, its availability and cost in relation to other materials, and its environmental acceptability under conditions of the individual program. Thus the operational material may change from year to year. Some registered chemicals, e.g. fenitrothion, have been withdrawn from use in Ontario until questions regarding public health or environmental hazard have been answered satisfactorily.

In addition to chemical insecticides, MNR utilizes, and encourages further research on alternative techniques, including synthetic pyrethroids, biological insecticides (bacterial, fungal, viral), growth regulators, and pheromones.

B. Purchases of 2,4-D herbicide are made each year on a district or regional basis. The regulations governing purchases of different dollar values are covered in MNR Procedure Directive SE.3.00.05. Most 2,4-D purchases are large enough to require that tenders be sent out. The companies invited to tender are drawn from those listed in the "Compendium of Pest Control Products Registered in Canada" (Agriculture Canada Publication 1654RP/76) as having the appropriate product as well as companies known to be distributors of 2,4-D for principal registrants. The successful supplier and brand name varies from year to year and even from district to district.

The source of supply of an insecticide depends upon whether the product is available through formulators or only the primary manufacturer. Insecticides available through different distributors are purchased by public tender; those with a restricted availability are acquired directly from the manufacturer.

For example: aminocarb Matacil — Chemagro Ltd., Mississauga, Ontario

B.t. - Thuricide - Sandoz Inc., San Diego, California

- Dipel - Abbot Laboratories Ltd., Montreal, Quebec

- Novobac - Cyanamid of Canada, Streetsville, Ontario

Ministry of Natural Resources Attachment 9.)

C. MNR does not have any multi-year contracts for the purchase of insecticides or herbicides.

D. The history of insecticide spraying in Northern Ontario is publicly recorded in the following publications (these are all available for review in the library of Great Lakes Forest Research Centre, Sault Ste. Marie, and some are available in public libraries).

Prebble, M.L. editor. 1975. "Aerial Control of Forest Insects in Canada" Information Canada, Ottawa, Cat. No. 70 23/19/1975.

"Report of the Annual Forest Pest Control Forum". Printed annually by Canadian Forestry Service, Ottawa.

"The Spruce Budworm Situation in Ontario" Published annually since 1970 as an Information Report of the Great Lakes Forest Research Centre, Sault Ste. Marie.

"Spruce Budworm Aerial Spraying Operations in Ontario". Published in conjunction with the Annual Reports of the Forest Insect and Disease Survey for the years prior to 1970.

As well, detailed information on use by MNR District is contained in the enclosed "Pesticide Use - Ministry of Natural Resources - 1978".

Reports on environmental impact studies conducted throughout the years are contained in several publications of the Forest Pest Management Institute and in the Reports of the Annual Forest Pest Control Forum.

(1) Detailed information on District use of herbicides is contained in the above-noted report, compiled in 1978. Information on herbicide use prior to 1978 may be found in the Annual Reports of the Ministry of Natural Resources (Department of Lands and Forests). The relevant categories are clearing, brush control, girdling, killing and poisoning although the acreages listed in most cases represent mechnical as well as chemical treatments.

(2) 2,4-D and, to a much lesser extent, 2,4,5-T are the only herbicides which have been used operationally to control brush for site preparation and conifer release. Simazine has been used to control grass. Silvisar has been used in frills to kill individual cull trees.

(3) This information has not been compiled as such. It could only be obtained by going through individual project records in each district.

(4) see 2D1

(5) See 2D3. 2,4-D and 2,4-D + 2,4,5-T mixtures have been applied at 1-3 lb total a.e. per acre. Simazine has been applied at 4-8 lb a.i. per sprayed acre (in many cases simazine is applied as a spot application so that the rate per gross acre is much less). Silvisar rates per acre are not meaningful due to the selective method of application.

Ministry of Natural Resources Attachment 9.)

(6) See 2D1.

(7) See 2D1. No differentiation has been made in the records between fixed wing and helicopter application.

(8) See 2D3. For aerial conifer release an average figure of $10 per acre is reasonably accurate.

(9) In 1979, a 2,4-D residue study was initiated. This will give information on residue dissipation in soil, woody plant material and berries in Northern Ontario. No other environmental impact studies on 2,4-D have been carried out in Northern Ontario. Extensive environmental impact studies in other countries and our own experience during 25 years of operational spraying indicate that there is no significant environmental impact of our program. For these reasons we do not see the need for further impact studies.

(10) The 1979 residue study is not complete so costs are not yet available.

E. (1) The only herbicide to be used in MNR's operational programs is 2,4-D while the list of candidate insecticides, chemical and non-chemical, available for spruce budworm control includes acephate, aminocarb, Bacillus thuringiensis, carbaryl, dimethoate, malathion, methomyl, trichlorfon and various strains of virus.

(2) The total amount of pesticides used will depend upon the total acreage to be treated, the severity of infestation (insecticides), the abundance of competing vegetation (herbicides) and, to a lesser extent, the comparative costs of the various pesticides.

(3) Plans for pesticide application in Northern Ontario in 1980 will not be finalized for some months yet. Available estimates for herbicide application of all types, suggest a total of 50,000 acres may be treated next year. (Northwest Region - 6,000 ac., Northcentral Region - 9,000 ac., Northern Region 30,000 ac., and Northeastern Region - 5,000 ac.) Estimates for insecticide treatment will not be available until about January 1980.

(4) Pesticides will be applied at registered rates; these rates are available from Agriculture Canada, Ministry of the Environment or the product label.

(5) Methods of application regularly employed by MNR include helicopters and fixed-wing aircraft, farm-style ground sprayers and small back-pack sprayers.

(6) see E3.

(7) Pesticide application programs begin in late spring and continue through the growing season as required, until first frost (early fall).

(8) Costs of pesticide application range from $3 to 10 per acre, depending upon total area treated and choice of application methods and materials.

Ministry of Natural Resources Attachment 9.)

The major alternatives that are in operational use or are at the field trial stage are: microbial insecticides (B.t. and virus), pheromones, insect growth regulators, protozoans, accelerated harvesting, stand conversion to less susceptible tree species, and hand cleaning of competing vegetation.

The use of parasites and predators of the spruce budworm is under consideration for small scale field trials.

(1) Regarding research effort, you should contact the lead forest research agencies, viz. Forest Pest Management Institute and Great Lakes Forest Research Centre at Sault Ste. Marie.

(2) Pathogenic fungi have been tested in Ontario without much success. As well pheromones appear to have limited potential as a control technique in the context of the current outbreak. However no technique has been "discarded" and the Ministry remains ready and willing to try any technique which seems to have good potential as a chemical alternative.

No, the Ministry does not have the appropriate staff or mandate to carry out this type of research.

Ministry of Transportation & Communications Attachment 10.)

2. HERBICIDES AND VEGETATION CONTROL

A. What herbicides are considered for use in the M.T.C. weed and brush control programs in Northern Ontario?

Only herbicides approved and registered by the Plant Products Division of Agriculture Canada and by the Ontario Ministry of the Environment are considered for use.

The herbicides currently recommended for use in M.T.C. spray programs are as follows:

2,4-D Amine	Sodium TCA	Dichlorprop
Amino Triazole	Tordon 101	Spike

B. From which chemical companies are the various herbicides purchased?

All chemical herbicides are purchased through Ministry Head Office purchasing section by public tender. The materials must meet Ministry specifications and tender requirements.

2,4-D Amine

Niagara Chemicals
Pfizer Co. Ltd.
Dow Chemical
Ciba Geigy Ltd.
Shell Canada Ltd.
Chipman Chemicals Ltd.
Vegetation Control Service
Fisons Corp. Ltd.

Amino Triazole

Amchem Products Inc.
Chipman Chemicals Ltd.
Cyanimid of Canada Ltd.

Tordon 101

Dow Chemical

Dichlorprop/2,4-D

Pfizer Co. Ltd.
Niagara Chemicals
Amchem Products Inc.

Sodium TCA

Green Cross Products
Chipman Chemicals Ltd.
Vegetation Control Service
Dow Chemical
Canadian Hoechst Ltd.
Niagara Chemicals

Spike

Elanco Products
Standish Brothers
Vegetation Control Service
Niagara Chemicals
Clintar Ltd.

C. Does M.T.C. establish multi-year contracts with these chemical companies for the purchase of certain herbicides?
1) which herbicides?
2) what is the usual length of these contracts?

No multi-year contracts for herbicides have been established. Supply contracts are placed annually based on the specific requirements for that year.

D. Since the M.T.C. weed and brush control program began, what herbicides have been used in Northern Ontario?
1) what years were each of these herbicides used?
2) what were each of them used for?
3) what amount was used of each of them each year?
4) how many km of right of way were sprayed with each of them each year?
5) what is the rate of application of each one used each year?
6) how were each of these herbicides applied each year ie. ground spraying from truck, helicopter, etc.
7) what was the cost of each of these spray programs each year?
8) were there any environmental impact studies done in any of these target areas following the spraying?

All the herbicides mentioned in 2A have been used in Northern Ontario. In addition, the pesticide 2,4,5-T was used prior to the 1979 spray season.

1) The herbicides reported have been used annually, but not necessarily in every District. The use of the various materials is dictated by the need ie. species to be controlled, topography, type of equipment available.

2) The following herbicides have been used for weed and brush control in Northern Ontario:

Brush Control

Tordon 101	@	1.5 - 2.0 gal/acre*
Sodium TCA	@	15.0 lbs/acre
2,4-D/2,4,5-T L.V. ester (96)	@	0.75 gal/acre
Dichlorprop/2,4-D L.V. ester (112)	@	1.0 gal/acre

Weed Control

Tordon 101		0.5 gal/acre
2,4-D amine		0.4 gal/acre
2,4-D/2,4,5-T L.V. ester (96)	@	0.4 gal/acre
Dichlorprop/2,4-D L.V. ester (112)	@	0.32 gal/acre
Amitrole		9.0 lbs/acre

Total Vegetation Control (guide rail, sign post areas only)

Spike	@	10.0 lbs/acre

*All above rates are in formulated product.

3) The amount used varies year by year and the total quantity used is only available through the local district spray records.

4) The approximate acreage treated in Northern Ontario encompassing the area from Huntsville northerly, in 1979 was 4500 for brush spraying and 2500 for weed control.

5) The M.T.C. rate of application is in accordance with the Pesticide Spray Manual and registered manufacturer's label recommendations for the various products used. For specific rates of application please see item 2D2.

6) All M.T.C. spraying is by ground application from a mobile spray truck. The majority of M.T.C. herbicide chemicals are applied in a thickened spray form designed to eliminate spray drift and ensure the spray remains on the target vegetation. Thickened spray application was pioneered by the M.T.C.

7) The approximate expenditure in 1979 for weed control programs in Northern Ontario was $50,000.00 and for brush control $240,000.00.

8) The environmental impacts from Ministry spray operations are being continually monitored by Ministry of Environment District and Regional Pesticide Control Officers. We have co-operated with the University of Guelph in a joint research study to evaluate the effectiveness of various drift control additives. A study on Tordon residue in the soil was carried out by M.T.C. and the Provincial Pesticides Residue Testing Laboratory and published in the scientific bulletin of Environmental Contamination and Toxicology. (attached).

E. What is M.T.C's plan for the 1980 weed and brush control program in Northern Ontario?

1) what herbicides will be used?
2) how much of each will be used?
3) how many km of right of way will be sprayed with each herbicide?
4) what will be the application rate of each herbicide?
5) how will each herbicide be applied?
6) when is the planned starting date (approx) of the various weed and brush control programs?
7) what will be the total estimated cost of the 1980 weed and brush control program in Northern Ontario?

The Ministry's herbicide control program for 1980 has not been finalized at this time. All Districts are currently preparing the 1980 program to be submitted to their respective Regional offices for approval by April, 1980.

1,2,3) The herbicides to be used will be those approved for Ministry use as listed in 2A. The quantity and acreage to be sprayed will be tabulated in the district submissions.

4) The rate of application is shown in question 2D2.

Ministry of Transportation & Communications Attachment 10.)

5) All herbicides will be applied from ground spray vehicles and most will be applied in a thickened spray form.

6) The starting date varies depending on the location, type of vegetation to be sprayed and weather conditions. Normally in Northern Ontario, this would be about the first week of June.

7) The cost of the 1980 program has not been determined at this time.

F. Are there any alternatives to chemical weed and brush control currently under consideration by M.T.C.?

1) what alternatives have been used or considered in the past and discarded?

Alternatives to chemical weed and brush control have always been considered and often used.

Mowing of weeds in areas inaccessible to spray equipment or adjacent to susceptible crops is carried out annually. Unfortunately, this usually does little to permanently eliminate the weed problem, only resulting in the weed flowering and producing seeds at a lower height. We, as a landowner, are required by the Ontario Weed Control Act, administered by the Ministry of Agriculture and Food, to destroy noxious weeds. Herbicide treatments have been the most effective and economical means to eliminate this problem vegetation.

Brush on the other hand bordering the travelled portion of the highway poses a hazard to the motorist, shades the road causing icing, and reduces snow storage areas. Woody brush can also impede drainage eventually leading to premature pavement deterioration. Hand or machine cutting removes the brush temporarily but creates a multitude of stems the following season compounding the problem. Chemical control has been the most effective and efficient method of controlling this brush and maintaining safe driving conditions.

This Ministry has adopted a general policy of ecological control of roadside areas not directly related to the functional aspects of the highway facility. Basically this is accomplished by encouraging the natural regeneration of indigenous growth. While this is primarily directed to Southern Ontario it also has application to certain areas of right-of-way in the north. This has the direct result of reducing the amount of herbicide control required in highway maintenance operations.

Northern Telephone Attachment 11.)

Question: 2. A. What herbicides are considered for use in the Northern Telephone Limited weed and brush control programs in Northern Ontario?

Answer: Prior to the 1979 spray year 2-4-D and sodium T.C.A. was used and this past summer Silva Prop. LV 112.

Question: 2 B. From which chemical companies are the various herbicides purchased?

Answer: Northern Telephone Limited purchased herbicides from the following: F.M.C. Canada Ltd. and Niagara Chemical

Question: 2. C. Does Northern Telephone Limited establish multi-year contracts with these chemical companies for the purchase of certain herbicides?

Answer: No, the purchasing group arrange purchases; once a request for certain chemicals is made. Price and delivery is the main concern.

Question: 2. D. Since the Northern Telephone Limited weed and brush control programs began, what herbicides have been used in Northern Ontario?

Answer: We have used 2-4-D - Sodium T.C.A. and lately Silva Prop LV 112.

Question: 2. D. 1) What years were each of these herbicides used?

Answer: Year

1975	2-4-D plus Sodium T.C.A.
1976	2-4-D plus Sodium T.C.A.
1977	2-4-D plus Sodium T.C.A.
1978	None
1979	Silva prop

Question: 2. D. 2) What were each of them used for?

Answer: They were used for brush control under aerial lines.

Question: 2. D. 3) What amount was used of each of them each year?

Answer:

Year	Type	Amount
1975	2-4-D And Sodium T.C.A.	180 gal. 890 lbs.
1976	Invoices misplaced	
1977	2-4-D	135 gal.
1978	None	
1979	Silva prop.	180 gal.

Question: 2. D. 4) How many acres (miles of roadside and right of way) were sprayed each year in each district (how much in Temiskaming, Cochrane, etc.)?

Answer: This is very hard to determine as a lot of this is only spot spraying in the required areas and not a continued spray along many miles of right of way.

Question: 2. D. 5) The rate of application of each one used each year.

Answer: The mixture of the chemicals used is 1 gal. of chemical to 100 gal. of water and the rate of application can vary depending on the amount of brush to be sprayed in a given area.

Question: 2. D. 6) How were each of these herbicides applied each year (ground spraying, helicopter, etc.).

Answer: The chemicals are applied from a truck with men equipped with hoses walking along the right of way.

Question: 2. D. 7) What was the cost of each of these spraying programs each year?

Answer: The cost of the spray program alone is very hard to determine as the same group is involved in spraying and brushing and costs are all charged to the same accounts.

The cost for chemicals are 1975 - $3,476.
estimated 1976 - $3,500.
1977 - $2,094.
no purchases 1978 - -
1979 - $2,821.

Question: 2. D. 8) Were there any environmental impact studies done in any of these target areas following the spray

Answer: The only studies carried out by the foremen is to s that we had a satisfactory coverage from the chemica applied.

Question: 2. E. What is Northern Telephone Limited's plan for the 19 wood and brush control program in Northern Ontario?

Answer: The Northern Telephone spray program is partially prepared at this time, it will involve spot spraying along the existing lines and, in the Timmins area, an extensive program as this area was not done durin 1979.

Question: 2. E. 1) What herbicides will be used?

Answer: At this time we believe the same chemicals as were used in 1979 will be used in 1980.

Question: 2. E. 2) How much of each will be used?

Answer: Probably over 200 gal. as Timmins area is 1 year

Question: 2. E. 3) How many acres (miles of roadside and right of way) will be sprayed with each of the separate herbicides?

Answer: This is difficult to estimate because in some locations the brush is very thick and between 2 and 4 ft. high.

Question: 2. E. 4) What will be the application rate?

Question: 2. E. 5) How will each herbicide be applied?

Answer: This also is hard to determine. The mixture will be per the chemical companies recommendations, bu depending on the quantity of brush in a given ar may require 10 to 15 gal. per acre.

Question: 2. E. 6) When is the planned starting date (approx.) of th various weed and brush control programs.

Answer: We tentatively plan to start spraying on June 2.

Question: 2. E. 7) What will be the total estimated cost of the 1980 wood and brush control program in Northern Telephone?

Answer: The total cost for brush control in Northern Telephone during 1980 will be between $60,000 and $65,000.

Question: 2. F. Are there any alternatives to chemical weed and brush control currently under consideration by Northern Telephone Limited?

Answer: We have used various methods in the past - including men equipped with axes and chain saws. These were found to be dangerous and very costly.

Once a tree of any size is cut, the stump develops many suckers and before long the area has to be re-cut. The best method to date is spraying and once an area is brought under control, a continued program of spot spraying is used.

During the past 3 years Northern Telephone Limited has been burying most of the rural plant. This is a 5 year program and will significantly reduce the amount of spraying required.

2. General Herbicides and Pesticides Information

(a) What pesticides are considered for use in any OMAF crop spraying programs in Northern Ontario?

OMAF does not have spraying programs. Farmers do their own spraying or hire custom sprayers.

Pesticides used by farmers will first of all be only those registered by Federal Government for sale in Canada for specific purposes and farmers will follow the recommendations in 296 etc. and the specific mandatory instructions on the companies' containers.

(b) Since the OMAF crop spraying programs began, what herbicides and pesticides have been used in these various programs in Northern Ontario?

This question is not applicable as OMAF does not have a spraying program.

(c) From which chemical companies are the various pesticides purchased?

Which ever ones the farmer decides to buy from.

(d) Does OMAF establish multi-year contracts with these chemical companies for the purchase of certain pesticides?

Not applicable.

(e) Does OMAF anticipate any 1980 crop spraying programs in Northern Ontario?

No. Many farmers, however, will spray for weeds, insects and disease.

(f) What alternatives to chemical weed and insect control are currently under consideration by OMAF?

There is ongoing research on control of insects by parasites, for example, alfalfa weevil.

Rotations and after harvest cultivation are two highly recommended non chemical controls.

Summer fallowing, which was practised extensively in the past, has been discarded to quite an extent for economic reasons and due to the fact it leaves fields bare and subject to wind and water erosion during the summer months.

I hope this information will be useful to you and your committee.

Ontario Hydro Attachment 13.)

Question

2 A. What herbicides are considered for use in the Ontario Hydro weed and brush control programs in Northern Ontario?

Answer

2 A. At this point in time, Picloram, 24D, 24DP, Sodium T.C.A., Simazine, Atrazine, Paraquat and Glyphosate are approved for use in weed and brush control work.

Question No. 2B

From which chemical companies are the various herbicides purchased?

Answer

	Company	Herbicide
1.	Dow Chemical	2,4-D, Picloram
2.	Union Carbide	2,4-D and 2,4-DP
3.	Fisons	2,4-D and 2,4-DP
4.	Pfizers	2,4-D and 2,4-DP
5.	Green Cross	2,4-D Sodium TCA
6.	Ciba Geigy	Simazine, Atrozine
7.	Monsanto	Roundup (glyphosate)
8.	Chipman	2,4-D Paraquat (gramoxone)

Question

2 C. Does Ontario Hydro establish multi-year contracts with these chemical companies for the purchase of certain herbicides?
1) which herbicides
2) what is the usual length of these contracts

Answer

2 C. No. Purchases are made on an annual basis. Qualified suppliers are asked to bid on our needs. Materials must meet Corporation standard specifications. All factors being equal, price determines the supplier selected.

Question

2 D. Since the Ontario Hydro weed and brush control programs began, what herbicides have been used in Northern Ontario?
1) what years were each of these herbicides used
2) what were each of them used for
3) what amount was used of each of them each year
4) how many acres (miles of roadside and right of way) were sprayed each year in each district (how much in Temiskaming, Cochrane, etc)
5) the rate of application of each one used each year
6) how were each of these herbicides applied each year (ground spraying, helicopter, etc.)
7) what was the cost of each of these spraying programs each year
8) were there any environmental impact studies done in any of these target areas following the spraying

Answer

2 D. (Pertaining to our Northeastern Region)

A few miles of rural distribution land were sprayed in 1950 using 24D. In 1952, a mixture of 24D and 245T, called Brushkill was used as well as sodium T.C.A. on high voltage rights-of-way. In 1966, Tordon 101 replaced Brushkill almost exclusively with approximately 25000 litres of the chemical being applied each year to 2000 hectares of high voltage rights-of-way and 1500 kilometres of rural distribution.

The 1979 spray costs for high voltage rights-of-way were approximately $600,000 for a control cost of approximately $40 per hectare per year.

The 1979 spray costs for rural distribution rights-of-way were approximately $400,000 for a control cost of approximately $65 per kilometre per year.

The concentration of spray solution is one litre of chemical per 100 litres of water. The heavier the brush the more is applied per hectare. The rate of application can vary from 10 litres of solution per hectare to 2000 litres of solution per hectare, depending upon brush density.

In 1979, all of the chemical application was done by ground spraying. In the past and possibly in the future, we might use Tordon 10K pellets from a fixed wing aircraft to treat inaccessible rights-of-way, but this is only done occasionally.

We monitor all work performed, but we do not call them environmental impact studies.

Question

2 E. What is Ontario Hydro's plan for the 1980 wood and brush control program in Northern Ontario?
1) what herbicides will be used
2) how much of each will be used
3) how many acres (miles of roadside and right of way) will be sprayed with each of the separate herbicides
4) what will be the application rate
5) how will each herbicide be applied
6) when is the planned starting date (approx.) of the various weed and brush control programs
7) what will be the total estimated cost of the 1980 wood and brush control program in Northern Ontario

Answer

(Pertaining to our Northeastern Region)

2 E. Ontario Hydro will conduct a spray operation similar to that which it has conducted in the past. No aerial applications are planned for 1980. Tordon 101 will be applied using the same rates and application methods used in the past and it will start around June 1, 1980. The total cost will be approximately the same as in 1979 except for inflation factors.

Question

2 F. Are there any alternatives to chemical weed and brush control currently under consideration by Ontario Hydro?
1) what alternatives have been used or considered in the past and discarded

Answer 2 F. Yes. We use various means of cutting the brush on our rights-of-way. This ranges from men using axes to huge machines with blades that operate like a rotary lawnmower. There are safety hazards with all of these methods and many places where the machines can't go. As well as this, every time a stump is cut, suckers develop from the cut stump, increasing the workload for the next cycle. The costs of doing the work this way are also significantly higher, but this method is used in locations where conditions justify this technique. Total reliance on cutting is unacceptable from a cost standpoint, and would be in conflict with the Corporation's policy of selective vegetation management.

We seed new rights-of-way with cover crops such as Reed Canary Grass, Brome Grass, Timothy, Trefoil and Crown Vetch, depending on the site requirements to prevent erosion and to provide competition with undesirable species. To date, some 3800 ha have been seeded to cover crops.

We use a selective spraying process. Once a right-of-way is under control for brush density, only those species which will cause maintenance problems are sprayed. This reduces the amount of chemical used and improves the aesthetics of the rights-of-way.

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